Exhibit A

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

IN RE GOOGLE PLAY STORE ANTITRUST LITIGATION THIS DOCUMENT RELATES TO: *In re Google Play Consumer Antitrust Litigation*, Case No. 3:20-cv-05761-JD *State of Utah et al. v. Google LLC et al.*, Case No. 3:21-cv-05227-JD	No. 3:21-md-02981-JD **MERITS REPLY REPORT OF** **HAL J. SINGER, PH.D.** Judge: Hon. James Donato

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before-tax price does or does not adjust in response to a change in the tax rate is directly informative of the pass-through rate. The regressions in Table 15 of my Merits Report are grounded in these standard principles.

15. Dr. Leonard claims that "Google's system does not allow developers to systematically set different pre-tax prices for different states in the US," but my regressions do not rely on "tax variation across states."[34] Dr. Leonard ignores that my regressions control for state fixed effects.[35] The inclusion of state fixed effects means that my regressions do not measure pass-through by comparing tax rates and prices across different states, as Dr. Leonard mistakenly suggests.[36]

3. Dr. Leonard Baselessly Rejects Standard Economic Principles of Pass-Through

16. In the past in his own published work, Dr. Leonard has acknowledged the standard economic principle that firms charge higher prices when their costs are higher and lower prices when costs are lower. He has written: "Economic theory makes a straightforward prediction: The decrease in cost will lead to a decrease in price, with the relationship between the decreases in cost and price depending on the shape of the demand curve."[37] As Dr. Leonard makes clear in his article, these fundamental conclusions regarding pass-through are not just abstract theoretical results; they apply directly to real-world economic outcomes.[38] Yet Dr. Leonard critiques me for estimating pass-through based on the shape of the demand curve in this case.[39]

17. In contrast, in his expert report, Dr. Leonard distances his opinions from these fundamental economic principles. Dr. Leonard claims baselessly that pass-through could be "negative" in the context of App pricing. In other words, Dr. Leonard speculates that developers

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money to the government.") (emphasis in original). Dr. Leonard ignores this basic principle when he claims that my regression is "uninformative about the pass-through of service fees," because "while the service fees are levied directly on the developers, sales taxes are levied directly on consumers." Leonard Report ¶81.

34. Leonard Report ¶81.

35. Singer Merits Report ¶368, Table 15 ("Fixed effects in column (2) are unique to App name, App subproduct, purchase type (App sale, In-App purchase, subscription), *customer state*, App category, and year. Fixed effects in column (1) are the same, except that they are not year-specific.") (emphasis added).

36. In Appendix 4, I demonstrate this point further by collapsing the data used in Table 15 down to the nationwide level; the regression results continue to show a positive and highly statistically significant relationship between the tax rate and the price.

37. Jerry Hausman & Greg Leonard, *Efficiencies from the Consumer Viewpoint,* 17(3) GEORGE MASON LAW REVIEW 707, 708 (1999) [hereafter Hausman & Leonard] ("What would be the effect on prices to consumers from the cost reduction? Economic theory makes a straightforward prediction: The decrease in cost will lead to a decrease in price, with the relationship between the decreases in cost and price depending on the shape of the demand curve.").

38. *Id.* ("[W]e have been continually surprised over the years that many lawyers at the antitrust agencies refuse to accept this proposition and instead claim that a monopolist will 'pocket the cost savings' and not pass any of them on to consumers. This claim is based on the incorrect assertion that only competition forces a firm to pass along cost savings. In fact, however, profit maximization by the firm causes it to pass along at least some of the cost savings in terms of a lower price, even if the firm is a monopolist.").

39. Dr. Leonard now claims that the analysis in Hausman & Leonard, *supra*, was limited to "discussing per unit marginal cost instead of the pertinent *ad valorem* cost." Leonard Report ¶63. In fact, any change in costs resulting from a lower take rate can be expressed equivalently as a change in per-unit costs. Singer Merits Report ¶363; ¶337 n. 795.

would *increase* their prices to the Consumer Class as a result of a *decrease* in their costs.[40] In a failed attempt to support this novel claim, Dr. Leonard offers a single, purely hypothetical example that does not make economic sense:

> Suppose a developer monetizes through both paid content and advertising. Following a service fee rate reduction, the developer may find it more profitable to increase the price (hence making more profit per sale) and lower the intensity of advertising (hence forgoing advertising revenue but at the same time limiting the reduction in consumer demand due to consumers' preference for less advertising). The more consumers value the app and the more consumers dislike advertising, the more appealing this change in pricing strategy may be for the developer. This would lead to a negative pass-through.[41]

18. Dr. Leonard's hypothetical contradicts elementary economics because it assumes nonsensically that developers would not initially maximize profit with respect to their advertising decisions, but would only belatedly decide to begin maximizing profit after the take rate falls. If the developer in this hypothetical were economically rational, it would set advertising intensity to maximize profit before the decline in the take rate. When the take rate declines, this would have no effect on the on the intensity of advertising that consumers are willing to tolerate. Therefore, Dr. Leonard's speculation that the developer would lower the advertising intensity and raise the price in response to a decrease in the take rate does not make economic sense. The lone reference that Dr. Leonard provides when putting forth his "negative pass-through" claim provides no support for it.[42]

4. Dr. Leonard's Empirical Estimates of Pass-Through Are Biased and Unreliable

19. Dr. Leonard attempts to measure pass-through using Google's limited take rate reductions in the actual world.[43] I have previously explained why this approach does not provide a reliable basis for estimating the market-wide pass-through that would have occurred in a more competitive but-for world:

- In a more competitive but-for world, all or almost all developers would enjoy substantially and permanently lower take rates.[44] In contrast, Google's recent take rate reductions have generally been limited to narrowly defined SKUs comprising a small share of developer revenue, and/or short time horizons, making it unlikely

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40. Leonard Report ¶33.
41. *Id.*
42. *Id.*, citing Anja Lambrecht et. al., *How do firms make money selling digital goods online?* 25(3) MARKETING LETTERS 331-341 (2014) [hereafter, Lambrecht et. al.]. This article provides no support for Dr. Leonard's "negative pass-through" claim. The article does not deal with pass-through at all. It provides a review of "how digital business raise revenue," and concludes by emphasizing that the research is still "in its infancy." Lambrecht et. al. at 339 ("**Conclusion[:]** In this review, we have discussed how digital businesses raise revenue. We have emphasized the strengths and weaknesses of the various revenue generators and the challenges that businesses face in earning revenue online. The literature has emphasized that selling subscriptions, advertising, and customer information can all sustain digital businesses, but this research is still in its infancy.")
43. Leonard Report ¶¶34-51.
44. Singer Class Reply Figure 1 (showing the vast majority of take rates between 29 and 30 percent). *Id.* Figure 2 (among take rates above 29 percent, and the vast majority are above 29.9 percent).

Exhibit B

From: Karma Giulianelli <karma.giulianelli@bartlitbeck.com>
Sent: Saturday, May 6, 2023 11:09 AM
To: Raphael, Justin
Cc: Xternal User - Hae Sung Nam; Brendan Glackin; Lauren Weinstein; Pomerantz, Glenn; Rocca, Brian C.; Shah, Sujal J.; Olasa, Kuruvilla; Mach, Kyle
Subject: RE: Play -- Individual Plaintiff Damages

Justin,

The individual plaintiffs will prove that they are injured through the testimony of Dr. Singer. Dr. Singer has testified that his disclosed model can calculate individual consumer damages by considering the applications they purchased. Google has the records of the purchased applications for the individual plaintiffs (both the class reps and the non-class reps). You asked whether we would supplement our expert reports to prove damages in a trial for individual plaintiffs. We will be supplementing the reports to provide the calculation of damages for the individual plaintiffs under all of the models previously disclosed by Dr. Singer.

BartlitBeck LLP
Karma M. Giulianelli | p: 303.592-3165 | c: 303.641-6599 | Karma.Giulianelli@BartlitBeck.com | 1801 Wewatta St. Suite 1200, Denver, Colorado 80202

From: Raphael, Justin <Justin.Raphael@mto.com>
Sent: Friday, May 5, 2023 8:37 PM
To: Karma Giulianelli <karma.giulianelli@bartlitbeck.com>
Cc: Xternal User - Hae Sung Nam <HNam@kaplanfox.com>; Brendan Glackin <bglackin@agutah.gov>; Lauren Weinstein <lweinstein@agutah.gov>; Pomerantz, Glenn <Glenn.Pomerantz@mto.com>; Rocca, Brian C. <brian.rocca@morganlewis.com>; Shah, Sujal J. <sujal.shah@morganlewis.com>; Olasa, Kuruvilla <Kuruvilla.Olasa@mto.com>; Mach, Kyle <kyle.mach@mto.com>
Subject: Play -- Individual Plaintiff Damages

Caution: External Message

Karma, at the trial summit last week, we asked how Plaintiffs intended to prove damages for individual plaintiffs if they are going to be part of the trial. You indicated that Plaintiffs would think about that issue. Can you let us know how the individual plaintiffs intend to prove damages?

Justin

Justin P. Raphael | Munger, Tolles & Olson LLP
560 Mission Street | San Francisco, CA 94105
Tel: (415) 512-4085 | justin.raphael@mto.com | www.mto.com

Exhibit C
Public Redacted Version

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

IN RE GOOGLE PLAY STORE ANTITRUST LITIGATION THIS DOCUMENT RELATES TO: *In re Google Play Consumer Antitrust Litigation*, Case No. 3:20-cv-05761-JD	No. 3:21-md-02981-JD **SUPPLEMENTAL MERITS REPORT** **OF** **HAL J. SINGER, PH.D.** Judge: Hon. James Donato

PARTY AND NON-PARTY HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY

INTRODUCTION

1. I have been asked by counsel for Consumer Plaintiffs to present individual damages calculations for plaintiffs Mary Carr, Daniel Egerter, Zack Palmer, Serina Moglia, Matthew Atkinson, and Alex Iwamoto, using classwide methods presented in my prior reports in this matter.[1] These calculations are detailed below, and summarized in the Conclusion (Table 4).

QUALIFICATIONS

2. My qualifications are provided in my prior reports.

INDIVIDUAL PLAINTIFF DAMAGES

3. Below I explain how damages are calculated for individual plaintiffs using five damages models set out in the Singer Merits Report. In the Singer Merits Report, I demonstrated how to calculate damages for any given individual U.S. Consumer by applying a common formula to that individual's purchase data.[2] Here I apply that methodology using purchase data produced in this litigation for each of the six Plaintiffs identified above. To illustrate these calculations, damages for plaintiff Carr are detailed below using each of the five damages models.

A. App/In-App Model

4. Under the App/In-App Model,[3] overcharges arise from lower take rates being passed on to Class Members in the form of lower prices. Overcharges for any given U.S. Consumer depend on (1) the Play Store category in which the consumer's expenditure occurred; and (2) whether those expenditures were made in the Android App Distribution Market or in the In-App Aftermarket.[4] As seen in Table 1 below, according to Play Store transaction data produced for [redacted],[5] since the beginning of the Class Period (August 16, 2016), [redacted] expenditures in the

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1. The materials I relied upon in forming my opinions are included in the footnotes throughout this report, listed in Appendix 1, or otherwise listed in my prior reports. Unless otherwise defined, capitalized terms herein are defined the same as they are in my prior reports. *See* Merits Report of Hal J. Singer, Ph.D. (October 3, 2022) (as updated on October 19, 2022) [hereafter, Singer Merits Report]; *see also* Merits Reply Report of Hal J. Singer, Ph.D. (December, 23, 2022) (as updated on January 6, 2023) [hereafter, Singer Merits Report]; Class Certification Report of Hal J. Singer, PhD (February 28, 2022) [hereafter, "Singer Class Cert Report"]; Class Certification Reply Report of Hal J. Singer, PhD (April 25, 2022) [hereafter, "Singer Class Cert Reply"]; Class Certification Reply Report of Hal J. Singer, PhD (Errata) (May 10, 2022) [hereafter, "Singer Class Cert Reply Errata"].

2. Singer Merits Report ¶¶422-429; Tables 23-24.

3. Singer Merits Report ¶305; Table 6 (calculating damages for the Android App Distribution Market). *Id.* ¶¶331-332; Table 8 (calculating damages for the In-App Aftermarket).

4. Singer Merits Report ¶423 (showing damages equal to overcharges multiplied by an individual's purchase volumes, calculated separately for the Android App Distribution Market and the In-App Aftermarket). *Id.* ¶¶427-428 (solving for overcharges for a given Play Store category using the category's actual take rate, the category's but-for take rate, and the pass-through rate). As before, for ease of exposition and presentation, here I present consumer-specific damages based on purchases within the Play Store's categories. However, the same framework could also be applied at the level of the developer. Consumer-specific damages would then be calculated based on an individual's expenditures for different developers, instead of different categories. Singer Merits Report ¶422, n. 957. The same caveat applies to the Single Take Rate Model and the Hybrid Model, both of which use category-specific damages for purposes of this report.

5. GOOG-PLAY-007335781 ([redacted] transaction data).

Android App Distribution Market came to [redacted] all of which were in the [redacted] category.[6] Overcharges for these expenditures come to 8.0 percent,[7] or $1.38.

TABLE 1: APP/IN-APP DAMAGES ([redacted])

Category	Market	Expenditures	Overcharge	Damages
[redacted]	App Distribution	[redacted]	8.0%	[redacted]
	In-App		16.9%	
[redacted]	In-App		15.5%	
Total		[redacted]	**14.99%**	[redacted]

Notes & Sources: GOOG-PLAY-007335781 [redacted] transaction data); backup materials ("Plaintiff Individual Damages.xlsx; 'Damages_[redacted]_App_In-App'"). Excludes any transactions with Purchase State "CANCELED" or with Doc Title "Unknown Item". Purchases other than in-app purchases or paid downloads, such as purchases of movies, music, or TV shows, are excluded. Excludes products sold by Google, such as Google Play Pass and Google One. Excludes transactions occurring before August 16, 2016.

5. In the In-App Aftermarket, [redacted] had expenditures totaling [redacted] in the [redacted] category.[8] Overcharges for these expenditures come to 16.9 percent,[9] or $7.05. [redacted] also had In-App expenditures totaling [redacted] in the [redacted] category.[10] Overcharges for these expenditures come to 15.5 percent,[11] or $13.23.

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6. These games were [redacted] for a total of [redacted]. *See* GOOG-PLAY-007335781. I used the "Doc Title" and "Doc Url" fields to determine whether a given purchase should be classified into the Android App Distribution Market, the In-App Aftermarket, or neither. Purchases in the Android App Distribution market list the name of the App in the "Doc Title" field, and list an App-specific URL in the "Doc Url" field. In contrast, purchases in the In-App Aftermarket list the name of the App in parentheses in the "Doc Title" field, preceded by the name of the IAP. In addition, purchases in the In-App Aftermarket do not include an App-specific URL in the "Doc Url" field, and instead provide a generic link to the Play Store. Using the "Doc Title" and "Doc Url" fields, I also excluded irrelevant purchases such as movies, music, and TV. I also excluded products sold by Google, such as Google Play Pass and Google One. These steps were necessary to identify the appropriate purchases because of the format in which Mary Carr and the other plaintiffs' individual data was produced, but would not be necessary to calculate individual damages for all U.S. Consumers. The Excel files that I used to calculate individual plaintiff damages in this report lack the full set of data fields from the Google Transaction Data that allowed me to identify (1) the Play Store category in which consumer expenditure occurred; and (2) whether those expenditures were made in the Android App Distribution Market or in the In-App Aftermarket. *See, e.g.,* Singer Merits Report Tables 6 & 8.

7. Singer Merits Report Table 23 (showing 8.0 percent overcharge for Games in the Android App Distribution Market).

8. Includes [redacted] transactions, ranging from $0.99 to $3.20 each, for a total of 6 x $0.99 + 1 x $1.06 + 2 x $1.99 + 6 x $2.99 + 1 x $3.18 + 3 x $3.20 = $41.70. Does not include two transactions that were excluded as duplicates because they were listed twice in [redacted] Excel file (GOOG-PLAY-007335781). The first is a $0.99 purchase of the [redacted] category in the [redacted] The second is a $1.99 purchase of [redacted] in the [redacted] game. In each case, I excluded one of the duplicate transactions from the total.

9. Singer Merits Report Table 24 (showing 16.9 percent overcharge for Games in the In-App Aftermarket).

10. Equal to 4 x $21.39. This includes four payments of [redacted] each for [redacted], a subscription offered through the App [redacted]

11. Singer Merits Report Table 24 (showing 15.5 percent overcharge for [redacted] in the In-App Aftermarket).

6. As seen in Table 1 above, [redacted] total App/In-App damages come to [redacted]. As detailed in Table 4, App/In-App damages for the other five individual plaintiffs range from to [redacted] to [redacted]

7. In the event that proof of pass-through is not legally necessary, I have been asked to calculate damages based on the full reduction in the take rate in the but-for world. Under this assumption, [redacted] total App/In-App damages come to [redacted] and App/In-App damages for the other five individual plaintiffs range from [redacted] to [redacted][12]

B. Discount Model

8. Under the Discount Model,[13] overcharges arise from direct discounts that Class Members would have received from Google in the but-for world, equal to 8.75 percent of Class Member expenditures.[14] As shown in Table 1 above, [redacted] total expenditures came to [redacted] Accordingly, [redacted] damages under the Discount Model come to [redacted]

9. As detailed in Table 4, Discount Model damages for the other five individual plaintiffs range from to [redacted] to [redacted]

C. Single Take Rate Model

10. Under the Single Take Rate Model,[15] overcharges arise from lower take rates being passed on to Class Members in the form of lower prices. Overcharges depend on the Play Store category in which consumer expenditure occurred.[16] Unlike the App/In-App Model, the Single Take Rate Model calculates a single but-for take rate for both the Android App Distribution Market and the In-App Aftermarket. Overcharges for the Single Take Rate Model are calculated using the procedure shown in Tables 23 and 24 of the Singer Merits Report, aggregating across the Android App Distribution Market and the In-App Aftermarket.

11. As seen in Table 2 below, [redacted] expenditures in the [redacted] category came to [redacted][17] Overcharges for these expenditures come to 7.2 percent,[18] or [redacted] expenditures in the [redacted] category came to [redacted][19] Overcharges for these expenditures come to 6.5 percent,[20] or [redacted]

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12. *See* backup materials ("Plaintiff Individual Damages_100 Percent PT.xlsx; 'Damages_All'")
13. Singer Merits Report ¶¶386-388; Table 16.
14. Equal to $0.79 in consumer overcharges per transaction divided by an initial price of $9.00. Singer Merits Report Table 16, Rows [8] and [17]. (Before rounding, consumer overcharges are $0.7879 per transaction, and the initial price is $9.004 per transaction).
15. Singer Merits Report ¶¶440-444; Table A4.
16. Singer Merits Report ¶¶427-428 (solving for overcharges for a given Play Store category using the category's actual take rate, the category's but-for take rate, and the pass-through rate).
17. Equal to $41.70 + $17.27. *See* Table 1, *supra*.
18. *See* backup materials ("Plaintiff Individual Damages.xls; 'Damages_Carr_STR'").
19. *See* Table 1, *supra*.
20. *See* backup materials ("Plaintiff Individual Damages.xls; 'Damages_Carr_STR'").

TABLE 2: SINGLE TAKE RATE DAMAGES [redacted]

Category	Expenditures	Overcharge	Damages
[redacted]	[redacted]	7.2% 6.5%	[redacted]
Total	[redacted]	**6.8%**	[redacted]

Notes & Sources: *See* Table 1, *supra*. *See also* backup materials ("Plaintiff Individual Damages.xlsx; [redacted]

12. As seen in Table 2 above, [redacted] total Single Take Rate damages come to [redacted]. As seen in Table 4, Single Take Rate damages for the other five individual plaintiffs range from to [redacted] to [redacted].

13. In the event that proof of pass-through is not legally necessary, I have been asked to calculate damages based on the full reduction in the take rate in the but-for world. Under this assumption, [redacted] total Single Take Rate damages come to [redacted], and Single Take Rate damages for the other five individual plaintiffs range from [redacted] to [redacted].[21]

D. Hybrid Model

14. Under the Hybrid Model,[22] overcharges arise from a combination of (1) lower take rates being passed on to Class Members in the form of lower prices (as in the Single Take Rate Model); and (2) direct discounts that Class Members would have received from Google in the but-for world, (as in the Discount Model).

15. Overcharges from (2) are equal to 6.2 percent of Class Member expenditures.[23] Overcharges from (1) depend on the Play Store category in which consumer expenditure occurred, and are calculated using the same procedure employed in the Single Take Rate Model, with a different (higher) but-for take rate.[24]

16. As seen in Table 3 below, [redacted] expenditures in the Games category came to [redacted][25] Pass-through overcharges on these expenditures come to 0.9 percent,[26] and total overcharges come to 0.9 percent + 6.2 percent[27] = 7.1 percent, or [redacted]

21. *See* backup materials ("Plaintiff Individual Damages_100 Percent PT.xlsx; 'Damages_All'")
22. Singer Merits Report ¶¶440-445; Table A5.
23. Equal to $0.70 - $0.15 = $0.55 in consumer overcharges per transaction divided by an initial price of $9.00. Singer Merits Report Appendix 4, Table A5, rows [7], [8], and [18]. More precisely, [0.7048 – 0.1478]/9.004 = 6.19 percent.
24. Singer Merits Report ¶445; Table A5, Row [17] (showing but-for take rate of 28.6 percent for the Hybrid Model). *Id.* Table A4, Row [13] (showing but-for take rate of 23.4 percent for the Single Take Rate Model).
25. Equal to $41.70 + $17.27. *See* Table 1, *supra*.
26. *See* backup materials ("Plaintiff Individual Damages.xls; 'Damages_[redacted]_Hybrid'").
27. More precisely, [0.7048 – 0.1478]/9.004 = 6.19 percent.

17. [redacted] expenditures in the [redacted] category came to [redacted][28] Pass-through overcharges on these expenditures come to 0.8 percent,[29] and total overcharges come to 0.8 percent + 6.2 percent = 7.0 percent, or [redacted]

TABLE 3: HYBRID DAMAGES ([redacted])

Category	Expenditures	Pass-Through Overcharge	Direct Discount Overcharge	Total Overcharge	Damages
[redacted]	[redacted]	0.9%	6.2%	7.1%	[redacted]
[redacted]		0.8%	6.2%	7.0%	
Total	[redacted]			**7.1%**	[redacted]

Notes & Sources: *See* Table 1, *supra*. *See also* backup materials ("Plaintiff Individual Damages.xlsx; '[redacted]. Damages total $10.18 instead of $10.19 due to rounding.

18. As seen in Table 3 above, [redacted] total Hybrid Model damages come to $4.19 + $6.00 = $10.18.[30] As detailed in Table 4, Hybrid Model damages for the other five individual plaintiffs range from to [redacted] to [redacted]

19. In the event that proof of pass-through is not legally necessary, I have been asked to calculate damages based on the full reduction in the take rate in the but-for world. Under this assumption, [redacted] total Hybrid Model damages come to [redacted] and Hybrid Model damages for the other five individual plaintiffs range from [redacted] to [redacted][31]

E. Amazon Discount Model

20. Under the Amazon Discount Model,[32] overcharges arise from direct discounts that Class Members would have received from Google in the but-for world, equal to 17.65 percent of consumer expenditure.[33] As shown in Table 1 above, [redacted] total expenditure came to $144.53. Accordingly, [redacted] damages under the Amazon Discount Model come to [redacted]

21. As detailed in Table 4, Discount Model damages for the other five individual plaintiffs range from to [redacted] to [redacted]

CONCLUSION AND SUMMARY TABLE

22. Using the five damages models set out in the Singer Merits Report, I calculate damages for the six individual plaintiffs analyzed here as follows:

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28. *See* Table 1, *supra*.
29. *See* backup materials ("Plaintiff Individual Damages.xls; '[redacted]
30. Damages total $10.18 instead of $10.19 due to rounding.
31. *See* backup materials ("Plaintiff Individual Damages_100 Percent PT.xlsx; 'Damages_All'")
32. Singer Merits Report ¶¶417-420; Tables 20-21.
33. Equal to but-for direct discounts of [redacted] percent in the but-for world less 1.61 percent in the actual world. Singer Merits Report ¶420; Table 21.

TABLE 4: INDIVIDUAL PLAINTIFF DAMAGES SUMMARY

Plaintiff	**Expenditure**	**App/In-App Damages**	**Discount Damages**	**Single Take Rate Damages**	**Hybrid Damages**	**Amazon Discount Damages**
[redacted]						

Notes & Sources: GOOG-PLAY-007335781 (Carr transaction data); GOOG-PLAY-007335779 (Egerter transaction data); GOOG-PLAY-007335778 (Palmer transaction data); GOOG-PLAY-010569450 (Iwamoto transaction data); GOOG-PLAY-007335782 (Atkinson transaction data); GOOG-PLAY-007376203 (Moglia transaction data); backup materials ("Plaintiff Individual Damages.xlsx"). Excludes transactions with Purchase State "CANCELED" or with Doc Title "Unknown Item". Purchases other than in-app purchases or paid downloads, such as purchases of movies, music, or TV shows, are excluded. Excludes products sold by Google, such as Google Play Pass and Google One. Excludes any transactions occurring before August 16, 2016.

***

Hal J. Singer, Ph.D.:

Executed on May 12, 2023.

APPENDIX 1: MATERIALS RELIED UPON

Merits Report of Hal J. Singer, Ph.D. (October 3, 2022) (as updated on October 19, 2022)

Merits Reply Report of Hal J. Singer, Ph.D. (December, 23, 2022) (as updated on January 6, 2023)

GOOG-PLAY-007335781 (Carr transaction data)

GOOG-PLAY-007335779 (Egerter transaction data)

GOOG-PLAY-007335778 (Palmer transaction data)

GOOG-PLAY-010569450 (Iwamoto transaction data)

GOOG-PLAY-007335782 (Atkinson transaction data)

GOOG-PLAY-007376203 (Moglia transaction data)

Exhibit D
Public Redacted Version

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

IN RE GOOGLE PLAY STORE ANTITRUST LITIGATION THIS DOCUMENT RELATES TO: *In re Google Play Consumer Antitrust Litigation,* Case No. 3:20-cv-05761-JD *State of Utah et al. v. Google LLC et al.,* Case No. 3:21-cv-05227-JD	Case No. 3:21-md-02981-JD

SUPPLEMENTAL EXPERT REPORT OF DR. GREGORY K. LEONARD

June 14, 2023

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I. QUALIFICATIONS

1. My name is Gregory K. Leonard. My qualifications are summarized in my rebuttal report submitted on November 18, 2022 ("Leonard Report"). My updated curriculum vitae is attached to this report as Appendix A.

II. ASSIGNMENT

2. I have been asked by counsel for Google to review and respond to the Supplemental Merits Report of Dr. Hal Singer ("the Singer Supplemental Report").

3. The information I have considered in forming my opinions for this supplemental report is listed in Appendix B.

III. SUMMARY OF OPINIONS

4. I have reached the following opinions:

a. To the extent that Dr. Singer has applied the injury and damages models from his prior reports to calculate damages for six individual plaintiffs ("the individual plaintiffs"), the critiques I have previously made of Dr. Singer's models apply to Dr. Singer's Supplemental Report as well.

b. Dr. Singer asserts that all developers of the paid app downloads, in-app purchases (IAPs), and subscriptions (referred to as "SKUs" in this report) purchased by the individual plaintiffs on Google Play during the class period (1) would have paid lower service fees in a but-for world without Google's challenged conduct than the fees that they paid in the actual world and (2) would have passed through a large percentage of the alleged service fee overcharge because they would have charged lower prices for SKUs in a world without Google's challenged conduct. However, a review of the real-world pricing behavior of the developers of these SKUs finds no clear evidence of pass-through by developers. In most instances, developers did not charge lower prices for these SKUs when they paid lower service fees. Moreover, in most instances where developers sell SKUs on their own websites in addition to Play, the developers charge the same price on both channels even though they do not pay any app store service fees for transactions on their own websites. That evidence contradicts Dr. Singer's opinion that higher service fees lead to higher prices. Thus, the real-world evidence concerning developer pass-through behavior is inconsistent with Dr. Singer's assertions about that behavior. Given that the evidence is

inconsistent with Dr. Singer's pass-through assumptions for the SKUs purchased by the individual plaintiffs, he has no valid basis to calculate damages for the individual plaintiffs based on those assumptions.

c. In 93% of the individual plaintiffs' transactions, the purchased SKU had a price ending in $0.99. Dr. Singer's estimates of the prices that developers would have charged for these SKUs almost never end in $0.99. Thus, Dr. Singer appears to predict that developers would have almost entirely abandoned focal point pricing in a world without Google's challenged conduct. Dr. Singer has not provided any support for that prediction.

d. Dr. Singer calculates damages for an individual plaintiff using <u>average</u> overcharge percentages for each app category that he calculated based on <u>all</u> transactions within that category (across all SKUs within the category, all consumers, and all time periods), not just the transactions for that specific plaintiff. Dr. Singer's use of these broad averages leads to economically nonsensical and anomalous results.

e. First, in his "app/in-app" damages calculations, Dr. Singer's method frequently estimates that developers were overcharged on service fees by an amount that is more than the total amount of the service fee they paid on the transaction. This makes no economic sense.

f. Second, in his "single take rate" and "hybrid" damages calculations, the but-for service fee rate that Dr. Singer predicts would have applied to many of the plaintiffs' transactions is higher than the service fee rate that actually applied to those transactions. Developers were not overcharged if they paid lower service fee rates in the real world than they would have paid in the but-for world, and they could not have passed through any overcharges on many transactions, which means that plaintiffs could not have suffered any pass-through overcharge injury on those transactions. However, Dr. Singer's methodology incorrectly predicts injury and calculates pass-through overcharge damages for those transactions.

g. Such transactions where Dr. Singer's "single take rate" and "hybrid" but-for service fees exceed the actual service fee are common after July 2021. I note that Dr. Singer did not calculate damages for the individual plaintiffs after November 2021, despite data being available through May 2022. He is silent on whether the individual plaintiffs sustained damages after November 2021 and the extent of any such damages.

h. I have applied my consumer subsidy damages model to the six individual plaintiffs. I find that damages for each plaintiff range from zero to $11.21. Because one plaintiff, [redacted], was not a member of the Play Points program in the actual world, and there is no evidence that this plaintiff would have joined the program in the but-for world, damages for this plaintiff are zero. Dr. Singer's use of averages to calculate damages for individual named plaintiffs leads him to predict damages for plaintiff [redacted] confirming that his methodology is flawed.

IV. DR. SINGER'S PASS-THROUGH ASSUMPTIONS ARE INCONSISTENT WITH THE REAL-WORLD BEHAVIOR OF DEVELOPERS

5. Dr. Singer's damage calculations for individual plaintiffs are based on the theory that (1) developers paid service fees higher than the fees that they would have paid without Google's challenged conduct[1] and (2) passed through a large percentage of the alleged service fee overcharge by charging higher prices than they would have charged without Google's challenged conduct.[2] Dr. Singer's pass-through methodology can be tested by analyzing whether it accurately predicts how developers changed prices when their service fees changed in the real world. It does not.

6. In the actual world, Google reduced the service fee rate applicable to sales of a number of the SKUs purchased by the individual plaintiffs.[3] Exhibit 1 lists, for each individual plaintiff, each SKU purchased, the pre- and post-tax prices paid by the individual plaintiff for the SKU (averaged across transactions if the individual plaintiff has more than one transaction for that SKU), and whether Google reduced the service fee rate applicable to that SKU between August 2016 and May 2022.[4]

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1 I discuss why Dr. Singer's damages analyses on developers' overcharges are flawed and unsupported in my rebuttal report. See Section VI.B, Leonard report.

2 Singer Supplemental Report ¶¶ 4-5, 10 and 14. Dr. Singer applies assumed pass-through rates that differ by app category.

3 See, e.g., "Changes to Google Play's service fee in 2021", Play Console Help, https://support.google.com/googleplay/android-developer/answer/10632485 and "Evolving Our Business Model to Address Developer Needs," Android Developers Blog, October 21, 2021, https://android-developers.googleblog.com/2021/10/evolving-business-model html. For a small number of SKUs purchased by individual plaintiffs, the service fee rate was reduced before July 2021.

4 I used the individual plaintiffs' purchase records (including order IDs, purchase timestamps, and the URLs of items purchased) to identify the relevant hashed consumer IDs and transactions in the Google Play transactions data. I note that Dr. Burtis used the same approach in her report. See production for Exhibit 22, Expert Report of Dr. Michelle M. Burtis, March 31, 2022.

7. I analyzed how developers responded when Google reduced the service fee rate applicable to these transactions. Specifically, I analyzed whether a developer that sold SKUs to the individual plaintiffs reduced prices when Google reduced service fees applicable to sales of those SKUs. For example, each graph in Exhibit 2A corresponds to a SKU that (1) plaintiff [redacted] purchased at some point during the class period, and (2) experienced a decrease in the applicable service fee to sales of that SKU from 30% to below 30% at some point between August 2016 and May 2022. The graph for each such SKU plots the monthly average transaction price to consumers and the monthly average service fee percentage. Exhibits 2B-F provide similar graphs for the other five individual plaintiffs. Figure 1 below shows the graph for a particular in-app SKU of the [redacted] app for plaintiff [redacted] and the graph for a particular subscription SKU of the [redacted] app for plaintiff [redacted].

8. The real-world evidence in Exhibit 2 is inconsistent with Dr. Singer's prediction that all developers would have charged lower prices if Google had charged them lower service fees. For most SKUs purchased by the individual plaintiffs on which Google reduced the applicable service fee rates, developers of those SKUs did not reduce prices. In the last column of Exhibit 1, I indicate for each SKU whether the developer consistently reduced the price of the SKU when the service fee rate applicable to that SKU was reduced.[5] For example, plaintiff [redacted] purchased the in-app

[5] I used the following criteria to determine if the developer of given SKU consistently reduced the price of the SKU (following a service fee rate reduction): (1) the average SKU price in the period following the first observed reduction in the service fee is lower than the average SKU price in the six months with non-zero sales preceding the first observed reduction in the service fee; and (2) the list price of the SKU is more than 1% lower than its "base" list price in more than half of the last five months with non-zero sales after the first observed reduction in the service fee, where the "base" list price is the list price with the highest frequency in the six months with non-zero sales preceding the first observed reduction in the service fee. There is no meaningful difference in results depending on whether the last five months with non-zero sales or all the months with non-zero sales after the first observed reduction in the service fee are used in the second part of the criteria. Under the latter (and keep the first part of the criteria same as above), only [redacted] out of [redacted] SKUs with apps distributed by [redacted] purchased by plaintiff [redacted] and [redacted] SKU from the [redacted] app purchased by plaintiff [redacted] would be considered as having consistent price reduction after the service fee

SKU [redacted] of [redacted] on August 20, 2019 at $1.99. The price of this SKU stays at $1.99, even after the service fee rate applicable to this SKU reduced from 30% to 15% in July 2021. As shown in Exhibit 2C, Google reduced the service fee rate applicable to many SKUs purchased by plaintiff [redacted]. The data show that developers selling those SKUs did not consistently reduce prices for any of those SKUs.

9. Evidence that individual plaintiffs purchased the same SKU at the same prices when that SKU was subject to different service fees illustrates that Dr. Singer's pass-through predictions are wrong. For example, plaintiff [redacted] purchased a monthly [redacted] subscription each month between August 2021 and May 2022. The service fee rate applicable to the first five of these transactions (between August 2021 and December 2021) was 30%. The service fee rate applicable to the last five transactions (between January 2022 and May 2022) was 15%. However, the difference in service fee rate did not lead [redacted] to charge different prices. Plaintiff [redacted] paid the same price of $1.99 for the [redacted] subscription when 30% service fee rate applied as when a 15% service fee rate applied.

10. To illustrate the magnitude of the discrepancy between Dr. Singer's pass-through predictions and actual pass-through behavior of developers, the graphs in Exhibit 2 plot the SKU price that Dr. Singer's methodology predicts in each month after July 2021, represented by the orange dots in Figure 1 below, for example.[6] The red dots in the graphs in Exhibit 2 plot the prices

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reduction. There is no difference in results depending on whether 6 months or 12 months are used in the first part of the criteria and when determining the base price either. See backup production of Exhibit 1.

6 I calculate this expected price following the first service fee rate reduction for each SKU under Dr. Singer's pass-through assumptions by (1) applying Dr. Singer's assumed pass-through rate (Υ) for the app category relevant to the app in question to calculate the ratio between the expected price and the actual app price, i.e., $(1-\Upsilon t_{pre})/(1-\Upsilon t_{post})$, based on Dr. Singer's passthrough formula laid out in the Singer Merits Report (see Equation V.8), where t_{pre} is the actual average service fee rate before the service fee rate reduction (which is equal to 30%) and t_{post} is the actual monthly average service fee rate after the service fee rate reduction (2) multiplying the ratio

that developers actually charged after Google reduced the service fee rate applicable to sales of the SKUs purchased by the plaintiffs. The wide difference between the orange dots representing the prices that Dr. Singer predicts and the red dots that developers actually charged shows the extent of the inaccuracy of Dr. Singer's pass-through assumption.[7]

11. Dr. Singer's assumptions regarding pass-through are also inconsistent with other real-world market evidence. Some of the subscription SKUs purchased by the individual plaintiffs were also sold by the developers on their own websites.[8] Developers are not subject to Google Play's service fees for sales of SKUs on their own websites.[9] Accordingly, if Dr. Singer were correct that lower Google service fee rates always lead to lower prices, then one would expect to find that developers uniformly charge lower prices on their websites (where they are not subject to app store service fees) than they charge for sales of the same SKUs in Google Play, which are subject to service fees. This is not what the data show, as summarized in Exhibit 3. For most SKUs purchased by the plaintiffs that developers sell both via Google Play and on their own websites, developers charge the same price on both channels even though sales on only one channel are subject to app store service fees.[10]

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by the app's average price in the four months preceding the first service fee reduction. See Merits Report of Hal J. Singer, Ph.D., October 3, 2022 (updated on October 19, 2022) (the "Singer Merits Report").

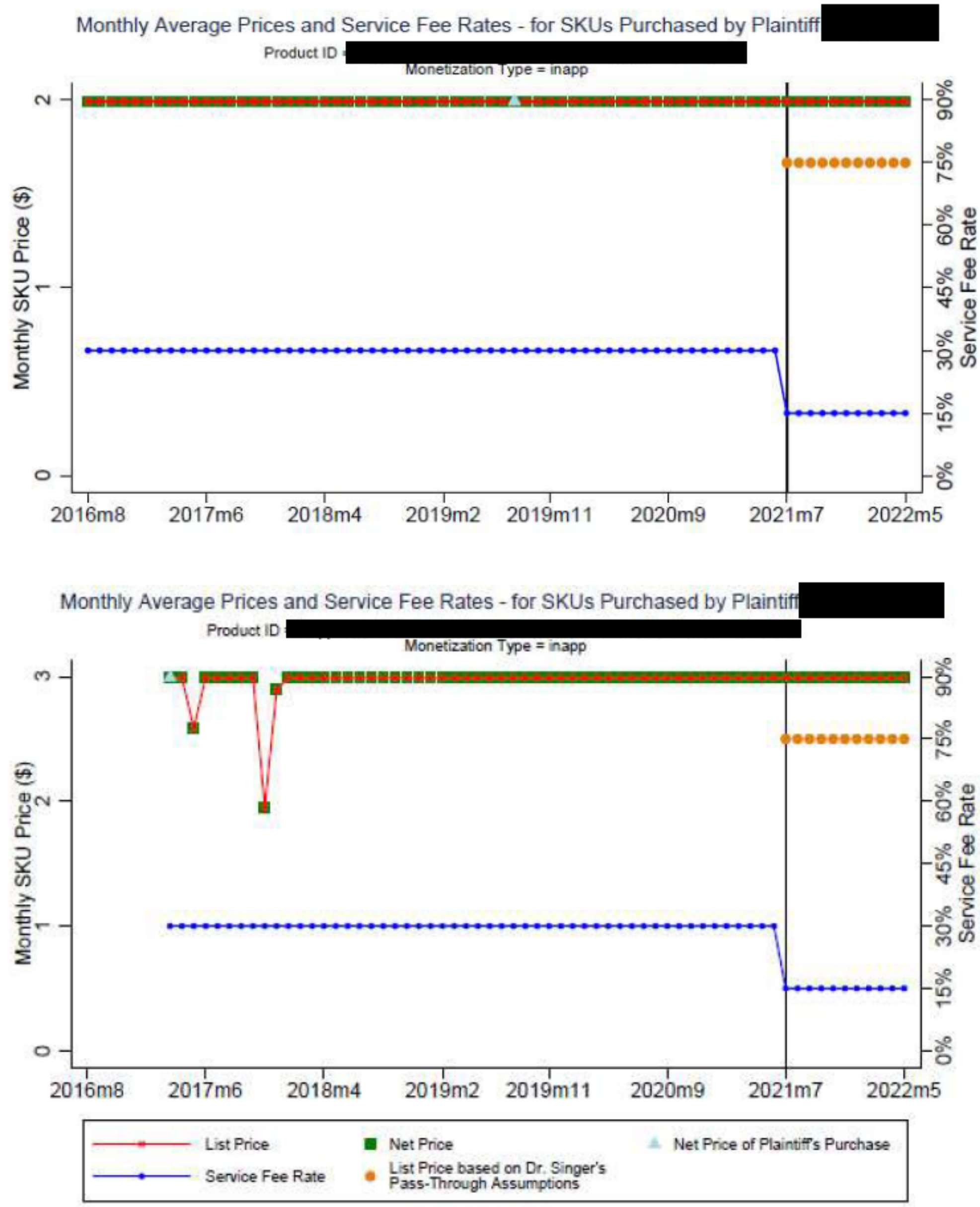
7 Furthermore, the empirical evidence does not suggest that developers launched new IAPs or subscriptions with lower prices to replace existing ones as a way to pass through the service fee rate reductions. See backup materials.

8 Exhibit 3 is focused on subscriptions because none of the paid download apps purchased by individual plaintiffs were also available on the developer's website and for IAPs it is difficult to identify the identical counterpart to the Play SKU on the website.

9 In his analysis of website prices and pass-through, Dr. Singer assumes developers pay a "zero percent" service fee on sales through a website. Singer Merits Report, Table 14.

10 I note that although [redacted] subscription prices are lower on its website than on Play, [redacted] priced the same for subscription transactions in Play regardless of whether [redacted]

Figure 1



Sources: Exhibits 2C and 2E.

[redacted] See https://support.google.com/googleplay/android-developer/answer/11222040?hl=en#zippy=%2Ccan-i-charge-a-different-price-on-the-alternate-billing-system-from-what-i-charge-google-plays-billing-system. [redacted] See Leonard Report ¶ 203. Therefore, evidence from [redacted] is not consistent with Dr. Singer's pass-through assumptions.

12. For example, [redacted] charges the same price for a [redacted] subscription that plaintiff [redacted] purchased on Play as it does on its own website. Similarly, the [redacted] app [redacted] charges the same price for its monthly subscriptions that plaintiff [redacted] purchased on Play as it does on its own website. Dr. Singer offers no explanation for why [redacted] and many other developers charge the same price on Play where they pay service fees as they do on their own websites where they do not pay service fees if lower service fees result in lower prices, or how plaintiffs such as [redacted] or [redacted] suffered damages from Google's conduct for their respective purchases from those developers.[11]

13. Dr. Singer's predictions regarding pass-through are also inconsistent with real-world data that demonstrate prevalent use of focal price points ending in $0.99. In Exhibit 4, I show the actual list price and Dr. Singer's predicted but-for prices based on his "app/in-app," "single take rate," and "hybrid" models for each of the individual plaintiffs' transactions. In 93% of the individual plaintiff transactions, the price paid ended in $0.99.[12] However, Dr. Singer's "app/in-app," "single take rate," and "hybrid" models predict that in a world without Google's challenged conduct, the prices of those same transactions would have ended in $0.99 for only 0%, 0.8%, and 0.2% of transactions, respectively. In other words, Dr. Singer appears to predict that developers would have almost entirely abandoned focal point pricing in a world without Google's challenged conduct. Dr. Singer has not provided any support for that prediction, which is flawed and inconsistent with real-world developer behavior.

[11] I note that, in contrast to Dr. Singer, in my report I explained how economic factors other than service fee pass-through can explain why a developer may charge a lower price on platforms other than Play. Leonard Report ¶ 78.

[12] When discussing Dr. Singer's "hybrid" model in this report, unless otherwise noted, I am focusing on the overcharge on consumer prices resulting from the pass-through of a service fee overcharge rather than a reduction in the consumer subsidy.

V. DR. SINGER'S USE OF AVERAGES PRODUCES ANOMALOUS RESULTS AND PREDICTS INJURY AND DAMAGES FOR CONSUMERS WHO WERE NOT INJURED

14. Dr. Singer calculates damages for an individual plaintiff using three figures:

- First, he calculates the average but-for service fee rate for each app category by multiplying the overall average but-for service fee rate by the ratio of the app category's average actual service fee rate to the overall average actual service fee rate (the overall average but-for service fee rate is estimated in his damages models, and the app category's average actual service fee rate and the overall average actual service fee rate are calculated using all the transactions between August 16, 2016 and May 31, 2022).[13] For example, in Dr. Singer's "single take rate" model, the overall average but-for service fee rate is 23.4% and the overall average actual service fee rate is 29.3%. For the app category "[redacted] the app category's average actual service fee rate is 27.2% and Dr. Singer calculates the app category's but-for service fee rate as 23.4%*(27.2%/29.3%), which is 21.8%.[14] Given the category average but-for service fee rate, the category average actual service fee rate, and the category average pass-through rate, he calculates an average overcharge percentage for the category.
- Next, he multiplies the average overcharge percentage for each category by the amount each plaintiff spent in total for transactions in that category.

[13] See Tables 4, 6, 23, 24, and Appendix Tables 4 and 5, Singer Merits Report.

[14] See Singer Supplemental Report production ("Plaintiff Individual Damages.xlsx", worksheet "STR Tables 23 & 24").

- Finally, he adds up the results of these calculations across app categories for each plaintiff.[15]

15. This method assumes that any overcharge was the same percentage for every transaction within a given category for all users in all time periods. For example, under his app/in-app model, Dr. Singer assumes that the overcharge percentage for plaintiff [redacted] purchase of a [redacted] subscription was 13.4% both in August 2021, when the service fee was 30%, and in May 2022, when the service fee was only 15%.[16] Similarly, Dr. Singer assumes that the overcharge percentage for plaintiff [redacted] purchase of a [redacted] subscription was 15.5% both in June 2021, when the service fee was 30%, and in July 2021, when the service fee was only 15%.[17]

16. Dr. Singer's assumption of a constant average overcharge percentage across apps, consumers, and time periods leads to certain economically nonsensical or anomalous results for the individual plaintiffs. For many transactions, this assumption results in estimates that the amount of the service fee overcharge was more than the total amount of the service fee paid. Specifically, as shown in Exhibit 5, Dr. Singer's methodology under his app/in-app model estimates that for [redacted] of the [redacted] transactions by the individual plaintiffs, the dollar amount of the service fee "overcharge" was more than the dollar amount of the service fee that the developer

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15 In his opening merits report, Dr. Singer presents four overcharge damages models. In his "hybrid" and "single take rate" models, Dr. Singer derives a single average but-for service fee rate. He then assumes that the but-for service fee rate for a given app category is equal to the average but-for service fee rate multiplied by the ratio of the category's actual service fee rate to the overall actual service fee rate. He uses the category-level but-for service fee rate, actual service fee rate, and pass-through rate to calculate a category-level overcharge rate. In the app/in-app model, Dr. Singer uses the same approach, but does it separately for paid downloads and IAPs. See Singer Supplemental Merits Report production ("Plaintiff Individual Damages.xlsx").

16 For each of plaintiff [redacted] transactions, Dr. Singer's overcharge percentage is 5.6% under his "single take rate" model and 0.7% under his "hybrid" model, regardless of the actual service fee.

17 For each of plaintiff [redacted] transactions, Dr. Singer's overcharge percentage is 6.5% under his "single take rate" model and 0.8% under his "hybrid" model, regardless of the actual service fee.

actually paid. For example, for plaintiff [redacted] purchases of the SKU [redacted] on July 1, 2021 and August 1, 2021, Dr. Singer calculates the service fee "overcharge" to be [redacted] but the actual service fee charged was only [redacted] ([redacted] of the [redacted] price) for both transactions. Similarly, for plaintiff [redacted] purchase of the SKU [redacted] on July 7, 2021, Dr. Singer calculates the service fee "overcharge" to be [redacted], but the actual service fee charged was only [redacted], or [redacted] of the [redacted] price. As a matter of economic logic, it makes no sense for a developer to have been overcharged by an amount more than it paid.[18] Thus, for any transaction where Dr. Singer estimates a service fee overcharge higher than the actual service fee the developer paid, Dr. Singer's overcharge is necessarily overstated. Moreover, because Dr. Singer's estimates of consumers' damages depend on pass-through of overcharges into higher prices, for any transaction where Dr. Singer estimates a service fee overcharge higher than the actual service fee the developer paid, Dr. Singer's method necessarily overstates any alleged damages.

17. Under his "app/in-app" model, Dr. Singer calculates an overcharge percentage at or greater than 15% for in-app purchases in the following app categories: [redacted][19] Data regarding transactions in Google Play through May 2022 contain 4,926,175 different accounts that only made purchases after July 2021 in these categories.[20] Of those, 316,312 different accounts only purchased subscriptions in these

[18] Unless the but-for service fee is assumed to be negative (i.e., Google pays developers). I am not aware of Dr. Singer or the plaintiffs claiming that developers would be subject to negative but-for service fees.

[19] Singer Merits Report, Table 23 and 24.

[20] Of these accounts, 956,857 are associated with states where consumers residing in those states are part of the definition of the consumer class.

categories after January 1, 2022.[21] A 15% service fee rate applied to every transaction made by those accounts. Yet Dr. Singer would calculate overcharge percentages that are greater than the service fee rates paid by developers for all of those transactions. As for the other 4,609,863 accounts, Dr. Singer may be calculating overcharge percentages greater than the service fee rates paid by developers on those transactions.[22] For example, if a consumer only purchased an IAP after July 2022 in a game that makes less than $1 million a year, the developer would only be subject to a 15% service fee rate on all transactions, but Dr. Singer would calculate a 16.9% overcharge under his "app/in-app" model.

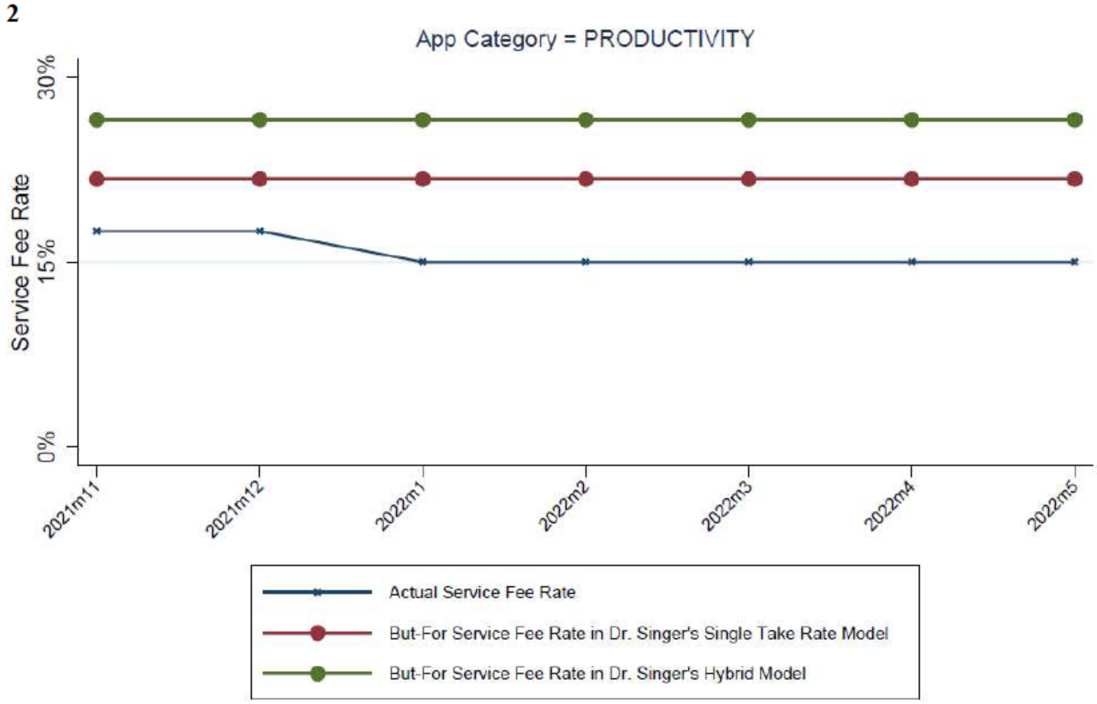
18. Another anomalous result from Dr. Singer's use of average overcharge percentages based on average but-for service fees is that his model predicts that developers would have paid higher service fee rates without Google's challenged conduct than they actually paid in the actual world with Google's challenged conduct. These anomalous predictions are particularly common for transactions toward the end of the class period, after Google reduced the service fee rates applicable to many SKUs, especially subscriptions. Exhibit 6 contains a graph for each app category that compares (1) the average service fee rate that Dr. Singer's "single take rate" and "hybrid" models estimate would have applied to transactions in that category in a world without Google's challenged conduct (which is an average across all transactions for all SKUs within the category and all time periods) and (2) the monthly actual service fee for plaintiff transactions in the category (which is an average over all plaintiff transaction SKUs within the category, but only over the transactions within the month) between November 2021 and May 2022. The graph for

[21] Of these accounts, 75,703 are associated with states where consumers residing in those states are part of the definition of the consumer class.

[22] Of these accounts, 881,154 are associated with states where consumers residing in those states are part of the definition of the consumer class.

the "productivity" category is provided as an example in Figure 2 below. As can be seen from Figure 2, Dr. Singer's "single take rate" and "hybrid" models predict that developers would have paid higher service fee rates for transactions in the productivity category without Google's challenged conduct than they actually paid in the real world for transactions in that category. The other graphs in Exhibit 6 show similar results for a number of other app categories.

Figure 2



Source: Exhibit 6.

19. Where Dr. Singer's models predict that developers would have paid higher service fee rates without Google's challenged conduct than they actually paid in the real world with Google's challenged conduct, the models predict that consumers who purchased those developers' SKUs were not injured on those purchases. The theory behind Dr. Singer's damages models is that (1) developers were overcharged and (2) developers passed on those overcharges by increasing prices. However, if developers paid lower service fees in the actual world than Dr. Singer's models

estimate they would have paid in the but-for world, then there were no overcharges to pass through by raising prices and so consumers could not have been injured by higher prices.[23]

20. This is the case for many transactions engaged in by the individual plaintiffs. Dr. Singer's "single take rate" and "hybrid" models predict that developers would have paid a higher service fee rate than they actually paid for [redacted] of the [redacted] transactions engaged in by the individual plaintiffs. About [redacted] of these [redacted] transactions occurred after November 2021. I note that Dr. Singer did not calculate damages for the individual plaintiffs after November 2021 even though data is available regarding the plaintiffs' transactions through May 2022. His supplemental report is silent on whether named plaintiffs sustained damages after November 2021 and the extent of any such damages.

21. The fact that Dr. Singer's models predict that developers often would have paid higher service fee rates without Google's challenged conduct than they actually paid in the real world suggests that many consumers were not injured. Data regarding transactions in Google Play through May 2022 contain 10,979,515 different accounts that only made purchases after July 2021.[24] Of those, 1,408,261 different accounts only purchased subscriptions and only made those

[23] Dr. Singer may argue that he could calculate transactions-level but-for service fees that would exceed the actual service fees for every transaction. However, it is important to understand that he would need to make a strong assumption to do so—he would have to assume that, at every point in time, the distribution of the transaction-level but-for service fees around their average was the same as the distribution of the transaction-level actual service fees around their mean. (Dr. Singer in fact employs an analogous assumption—without any support--when he calculates the category-level but-for fees.) Dr. Singer has no support for such an assumption and, indeed, logic suggests that the but-for service fees had less dispersion than the actual service fees toward the end of the period. In 2022, for example, the dispersion of actual service fees increased because of the service fee reductions for some apps such as subscriptions. There is no reason to think that the dispersion of but-for service fees increased in 2022 at all, let alone by the same amount as actual service fees, particularly if the decrease in actual service fees for some apps reflects a narrowing between the actual service fees and the but-for fees for those apps.

[24] Of these accounts, 2,289,662 are associated with states where consumers residing in those states are part of the definition of the consumer class.

purchases after January 1, 2022.[25] A 15% service fee rate applied to every one of the transactions made by those accounts. That service fee rate was lower than the but-for service fee rate estimated by Dr. Singer's "single take rate" and "hybrid" models. Thus, there were no overcharges under Dr. Singer's "single take rate" and "hybrid" models on the transactions made by these 1,408,261 accounts, no overcharges could have been passed through to the consumers with those accounts, and those consumers were not injured. However, Dr. Singer's damages methodology would predict injury and calculate pass-through overcharge damages for all of those consumers even though they could not have been injured or damaged at all. Many of the other 9,571,254 consumers that only made purchases after July 2021 also may not have suffered any overcharges under Dr. Singer's "single take rate" and "hybrid" models. To the extent these consumers only made purchases from developers that had a 15% service (because they had yearly sales under $1 million or were subject to some other program that resulted in a lower service fee), they could not have been injured under Dr. Singer's "single take rate" and "hybrid" models.

VI. Individual Plaintiff Overcharge Damages

[redacted]

22. Dr. Singer estimates that plaintiff [redacted] sustained overcharge damages of [redacted] and [redacted] based on his "single take rate" and "app/in-app" models.[26] In my opinion, however, there is no basis for Dr. Singer's estimates and there is no evidence that plaintiff [redacted] suffered any overcharge damages.

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[25] Of these accounts, 332,614 are associated with states where consumers residing in those states are part of the definition of the consumer class.

[26] Singer Supplemental Report, Table 4. The overcharge damages reported do not include Dr. Singer's "hybrid" model given that that model produces a combination of overcharge and subsidy.

23. During the class period (until May 2022), plaintiff [redacted] engaged in [redacted] transactions involving [redacted] SKUs. Of those [redacted] SKUs, [redacted] were subject to a service fee reduction. However, as shown in more detail in Exhibits 1A and 2A, in no instance did a developer consistently reduce price after Google reduced the service fee rate in the manner that is predicted by Dr. Singer's overcharge models.

24. Additionally, [redacted] of plaintiff [redacted] [redacted] transactions had a pre-tax price ending in "99." However, Dr. Singer's models predict that the developer would charge a price that ends in "99" for none of those transactions.[27] There is no evidence that these developers would depart from a focal point pricing strategy in the but-for world.

25. Finally, for [redacted] of plaintiff [redacted] transactions, Dr. Singer's "app/in-app" model estimates that the developers were overcharged by more than what they paid in service fees, and these two transactions were subject to service fees that are lower than Dr. Singer estimates for but-for service fees under his "single take rate" and "hybrid" models.[28]

[redacted]

26. Dr. Singer estimates that plaintiff [redacted] sustained overcharge damages of [redacted] and [redacted] based on his "single take rate" and "app/in-app" models.[29] In my opinion, however, there is no basis for Dr. Singer's estimates and there is no evidence that plaintiff [redacted] suffered any overcharge damages.

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[27] See Appendix C1.

[28] See Appendix C1.

[29] Singer Supplemental Report, Table 4.

27. During the class period (until May 2022), plaintiff [redacted] engaged in [redacted] transactions involving [redacted] SKUs. Of those SKUs, [redacted] were subject to a service fee reduction. However, as shown in more detail in Exhibits 1B and 2B, in no instance did a developer consistently reduce price after Google reduced the service fee rate in the manner that is predicted by Dr. Singer's overcharge models.

28. Plaintiff [redacted] purchased a subscription in [redacted] apps – [redacted] – at the same or lower price as what the developers charge on their respective websites.[30] There is no evidence the developers of these [redacted] apps would have reduced prices for those subscriptions in the app lower than what they charge on their own website if that developer had paid a lower service fee rate on Play.

29. Additionally, [redacted] of plaintiff [redacted] transactions had a pre-tax price ending in "99." However, Dr. Singer's models predict that the developer would charge a price that ends in "99" for none of those transactions. There is no evidence that these developers would depart from a focal point pricing strategy in the but-for world.[31]

30. Finally, for [redacted] of plaintiff [redacted] transactions, Dr. Singer's "app/in-app" model estimates that the developers were overcharged by more than what they paid in service fees, and seven of the transactions were subject to service fees that are lower than Dr. Singer estimates for but-for service fees under his "single take rate" and "hybrid" models.[32]

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[30] I note that as of May 2023, [redacted] redirects users who attempt to subscribe in-app to the [redacted] website. Thus, I compare the subscription prices paid by plaintiff [redacted] and the website price charged at the time of the purchase. For other subscriptions that are available to purchase from Google Play, I compare their prices as of May 2023 from Google Play and their respective websites. See Exhibit 3.

[31] See Appendix C2.

[32] See Appendix C2.

[redacted]

31. Dr. Singer estimates that plaintiff [redacted] sustained overcharge damages of [redacted] and [redacted] based on his "single take rate" and "app/in-app" models.[33] In my opinion, however, there is no basis for Dr. Singer's estimates and there is no evidence that plaintiff [redacted] suffered any overcharge damages.

32. During the class period (until May 2022), plaintiff [redacted] engaged in [redacted] transactions involving [redacted] SKUs. Of those [redacted] SKUs, [redacted] were subject to a service fee reduction. However, as shown in more detail in Exhibits 1C and 2C, in no instance did a developer consistently reduce price after Google reduced the service fee rate in the manner that is predicted by Dr. Singer's overcharge models.

33. Plaintiff [redacted] purchased subscriptions in [redacted] and a subscription in the [redacted] app at the same price as what the developers charge on their website. There is no evidence the developers of the two apps would have reduced prices for subscriptions in the app lower than what they charge on their own websites if the developers had paid a lower service fee rate on Play.[34]

34. Additionally, each of plaintiff [redacted] transactions had a pre-tax price ending in "99." However, Dr. Singer's models predict that the developer would charge a price that ends in "99" for none of those transactions. There is no evidence that these developers would depart from a focal point pricing strategy in the but-for world.[35]

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[33] Singer Supplemental Report, Table 4.

[34] See Exhibit 3 and Appendix C3.

[35] See Appendix C3.

35. Finally, for three of plaintiff [redacted] transactions (all with the [redacted] app), Dr. Singer's "app/in-app" model estimates that the developer was overcharged by more than what it paid in service fees, and these three transactions were subject to service fees that are lower than Dr. Singer estimates for but-for service fees under his "single take rate" and "hybrid" models.[36]

[redacted]

36. Dr. Singer estimates that plaintiff [redacted] sustained overcharge damages of [redacted] and [redacted] based on his "single take rate" and "app/in-app" models.[37] In my opinion, however, there is no basis for Dr. Singer's estimates.

37. During the class period (until May 2022), plaintiff [redacted] engaged in [redacted] transactions involving [redacted] SKUs. Of those SKUs, [redacted] were subject to a service fee reduction. However, as shown in more detail in Exhibits 1D and 2D, for [redacted] of those SKUs, the developer did not consistently reduce price after Google reduced the service fee rate in the manner that is predicted by Dr. Singer's overcharge models. The only exceptions are [redacted] SKUs related to apps distributed by [redacted]

38. Plaintiff [redacted] purchased a subscription in the [redacted] app at the same price as what the developer charges on its website. There is no evidence the developer of the [redacted] app would have reduced prices for subscriptions in the app lower than what it charges on its own website if that developer had paid a lower service fee rate on Play.[38]

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[36] See Appendix C3.

[37] Singer Supplemental Report, Table 4.

[38] See Exhibit 3 and Appendix C4.

39. Additionally, [redacted] of plaintiff [redacted] transactions had a pre-tax price ending in "99." However, only one of Dr. Singer's models, the "single take rate model," predicts that the developer would charge a price that ends in "99," and even then for only three of those transactions. There is no evidence that these developers would depart from a focal point pricing strategy in the but-for world.[39]

40. Finally, for [redacted] of plaintiff [redacted] transactions, Dr. Singer's "app/in-app" model estimates that the developers were overcharged by more than what they paid in service fees, and [redacted] of the transactions were subject to service fees that are lower than Dr. Singer estimates for but-for service fees under his "single take rate" and "hybrid" models.[40]

[redacted]

41. Dr. Singer estimates that plaintiff [redacted] sustained overcharge damages of [redacted] and [redacted] based on his "single take rate" and "app/in-app" models.[41] In my opinion, however, there is no basis for Dr. Singer's estimates and there is no evidence that plaintiff [redacted] suffered any overcharge damages.

42. During the class period (until May 2022), plaintiff [redacted] engaged in [redacted] transactions involving [redacted] SKUs. Of those SKUs, three were subject to a service fee reduction. However, as shown in more detail in Exhibits 1E and 2E, for none of these SKUs did a developer consistently reduce price after Google reduced the service fee rate in the manner that is predicted by Dr. Singer's overcharge models.

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39 See Appendix C4.

40 See Appendix C4.

41 Singer Supplemental Report, Table 4.

43. Plaintiff [redacted] purchased a subscription in the [redacted] app at the same price as what the developer charges on its website. There is no evidence the developer of the Microsoft OneDrive app would have reduced prices for subscriptions in the app lower than what it charges on its own website if that developer had paid a lower service fee rate on Play.[42]

44. Additionally, all of plaintiff [redacted] transactions had a pre-tax price ending in "99." However, Dr. Singer's models predict that the developer would charge a price that ends in "99" for none of those transactions. There is no evidence that these developers would depart from a focal point pricing strategy in the but-for world.[43]

45. Finally, for [redacted] of plaintiff [redacted] transactions (all with the [redacted] app), Dr. Singer's "app/in-app" model estimates that the developer was overcharged by more than what it paid in service fees, and these five transactions were subject to service fees that are lower than Dr. Singer estimates for but-for service fees under his "single take rate" and "hybrid" models.[44]

[redacted]

46. Dr. Singer estimates that plaintiff [redacted] sustained overcharge damages of [redacted] and [redacted] based on his "single take rate" and "app/in-app" models.[45] In my opinion, however, there is no basis for Dr. Singer's estimates and there is no evidence that plaintiff [redacted] suffered any overcharge damages.

47. During the class period (until May 2022), plaintiff [redacted] engaged in [redacted] transactions involving [redacted] SKUs. Of those SKUs, [redacted] were subject to a service fee reduction. However, as

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[42] See Exhibit 3 and Appendix C5.

[43] See Appendix C5.

[44] See Appendix C5.

[45] Singer Supplemental Report, Table 4.

shown in more detail in Exhibits 1F and 2F, in no instance did a developer consistently reduce price after Google reduced the service fee rate in the manner that is predicted by Dr. Singer's overcharge models.

48. Plaintiff [redacted] purchased a subscription in [redacted] apps – [redacted] – at the same price as what the developers charge on their respective websites. There is no evidence the developers of the six apps would have reduced prices for subscriptions in the app lower than what it charges on its own website if that developer had paid a lower service fee rate on Play.[46]

49. Additionally, [redacted] of plaintiff [redacted] transactions had a pre-tax price ending in "99." However, Dr. Singer's "single market" and "hybrid" models only predict that the developer would charge a price that ends in "99" for one of those transactions, while the "app/in-app" model predicts zero. There is no evidence that these developers would depart from a focal point pricing strategy in the but-for world.[47]

50. Finally, for [redacted] of plaintiff [redacted] transactions, Dr. Singer's "app/in-app" model estimates that the developers were overcharged by more than what they paid in service fees, and [redacted] of the transactions were subject to service fees that are lower than Dr. Singer estimates for but-for service fees under his "single take rate" and "hybrid" models.[48]

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[46] See Exhibit 3 and Appendix C6.

[47] See Appendix C6.

[48] See Appendix C6.

VII. CONSUMER SUBSIDY DAMAGES

51. Dr. Singer also calculates damages for the individual plaintiffs based on the "consumer subsidy" approach and the Amazon discount model he used in his opening merits report. In performing these calculations, he assumes that the but-for percentage discounts that each individual plaintiff would have received from Google would have equaled the but-for percentage discounts that Dr. Singer derived for the consumer class as a whole in his opening merits report.[49]

52. I discussed in my rebuttal report why Dr Singer's consumer subsidy damages models are flawed and unsupported.[50]

53. Plaintiff [redacted] was not a member of the Play Points program at any point during the class period in the actual world and I have seen no evidence to suggest that this individual would join the Play Points program in the but-for world. Nevertheless, Dr. Singer applies the same but-for discount rate to plaintiff [redacted] purchases as he did when calculating aggregate damages for the entire consumer class. He provides no explanation for why plaintiff [redacted] would have received Play Points in the but-for world when she was not a member of the Play Points program in the actual world.

54. As an alternative to Dr. Singer's consumer subsidy calculations, I apply to each individual plaintiff the same methodology for calculating consumer subsidy damages that I used in my rebuttal report. Specifically, for each individual plaintiff, I calculated the average Play Points and other discounts received as a percentage of transactions during the period he or she was a member of the Play Points program. I then assumed that, in the but-for world, the named plaintiff would

[49] Singer Supplemental Report ¶¶ 8 and 20.

[50] Leonard Report, Section VI.C-D.

have begun receiving this level of discounts as of the start of the class period plus the number of months between when the Play Points program was introduced and when the plaintiff joined the program. Damages for an individual plaintiff are equal to the amount of discounts (in dollars) received in the but-for world minus the amount of discounts (in dollars) received in the actual world.

55. As noted above, plaintiff [redacted] was not a member of the Play Points program at any point during the class period. Accordingly, applying my methodology, the damages for this plaintiff are zero.

56. The individual plaintiff consumer subsidy damages are presented in Exhibit 7.

Gregory K. Leonard

Dated: June 14, 2023

Exhibit 5
Individual Plaintiffs' Transactions
With Service Fee Overcharges Predicted by Dr. Singer's App/In-App Model Higher Than Actual Service Fee Paid
August 16, 2016 - May 31, 2022

No.	Plaintiff	Purchase Date	Product ID	Type	App Category	Pre-Tax List Price	Service Fee Rate	Service Fee ($)	Service Fee Overcharges ($) Predected by Dr. Singer's App/In-App Model
1	[redacted]								
2	[redacted]								
3	[redacted]								
4	[redacted]								
5	[redacted]								
6	[redacted]								
7	[redacted]								
8	[redacted]								
9	[redacted]								
10	[redacted]								
11	[redacted]								
12	[redacted]								

Exhibit 5
Individual Plaintiffs' Transactions
With Service Fee Overcharges Predicted by Dr. Singer's App/In-App Model Higher Than Actual Service Fee Paid
August 16, 2016 - May 31, 2022

No.	Plaintiff	Purchase Date	Product ID	Type	App Category	Pre-Tax List Price	Service Fee Rate	Service Fee ($)	Service Fee Overcharges ($) Predected by Dr. Singer's App/In-App Model
13	[redacted]								
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

Exhibit 5
Individual Plaintiffs' Transactions
With Service Fee Overcharges Predicted by Dr. Singer's App/In-App Model Higher Than Actual Service Fee Paid
August 16, 2016 - May 31, 2022

No.	Plaintiff	Purchase Date	Product ID	Type	App Category	Pre-Tax List Price	Service Fee Rate	Service Fee ($)	Service Fee Overcharges ($) Predected by Dr. Singer's App/In-App Model
25	[redacted]								
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									

Exhibit 5
Individual Plaintiffs' Transactions
With Service Fee Overcharges Predicted by Dr. Singer's App/In-App Model Higher Than Actual Service Fee Paid
August 16, 2016 - May 31, 2022

No.	Plaintiff	Purchase Date	Product ID	Type	App Category	Pre-Tax List Price	Service Fee Rate	Service Fee ($)	Service Fee Overcharges ($) Predected by Dr. Singer's App/In-App Model
37	[redacted]								
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									

Exhibit 5
Individual Plaintiffs' Transactions
With Service Fee Overcharges Predicted by Dr. Singer's App/In-App Model Higher Than Actual Service Fee Paid
August 16, 2016 - May 31, 2022

No.	Plaintiff	Purchase Date	Product ID	Type	App Category	Pre-Tax List Price	Service Fee Rate	Service Fee ($)	Service Fee Overcharges ($) Predected by Dr. Singer's App/In-App Model
49	[redacted]								
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

Exhibit 5
Individual Plaintiffs' Transactions
With Service Fee Overcharges Predicted by Dr. Singer's App/In-App Model Higher Than Actual Service Fee Paid
August 16, 2016 - May 31, 2022

No.	Plaintiff	Purchase Date	Product ID	Type	App Category	Pre-Tax List Price	Service Fee Rate	Service Fee ($)	Service Fee Overcharges ($) Predected by Dr. Singer's App/In-App Model
61	[redacted]								
62									
63									
64									
65									
66									
67									
68									
69									
70									
71									
72									

Exhibit 5
Individual Plaintiffs' Transactions
With Service Fee Overcharges Predicted by Dr. Singer's App/In-App Model Higher Than Actual Service Fee Paid
August 16, 2016 - May 31, 2022

No.	Plaintiff	Purchase Date	Product ID	Type	App Category	Pre-Tax List Price	Service Fee Rate	Service Fee ($)	Service Fee Overcharges ($) Predected by Dr. Singer's App/In-App Model
73	[redacted]								
74									
75									
76									
77									
78									
79									
80									
81									
82									
83									
84									

Exhibit 5
Individual Plaintiffs' Transactions
With Service Fee Overcharges Predicted by Dr. Singer's App/In-App Model Higher Than Actual Service Fee Paid
August 16, 2016 - May 31, 2022

No.	Plaintiff	Purchase Date	Product ID	Type	App Category	Pre-Tax List Price	Service Fee Rate	Service Fee ($)	Service Fee Overcharges ($) Predected by Dr. Singer's App/In-App Model
85	[redacted]								
Number of Individual Plaintiffs' Transactions with Service Fee Overcharge ($) Predicted by Dr. Singer Greater Than the Actual Service Fee ($) Paid				**85**					

Note:
[1] Service fee is null for one of the individual plaintiffs' transaction (order_id=GPA 3339-3004-4884-61241) in the Google Play transactions data This transaction is excluded from analysis

Sources:
[1] Google Play transactions data: GOOG-PLAY-007203251; GOOG-PLAY3-000018260
[2] Transactions Data for Individual Plaintiffs, GOOG-PLAY-007335789, GOOG-PLAY-007335790, GOOG-PLAY-007335791, GOOG-PLAY-007335792, GOOG-PLAY-007335793, GOOG-PLAY-007335794, GOOG-PLAY-007376204 and GOOG-PLAY-007376207
[3] Purchase History Data for Individual Plaintiffs, GOOG-PLAY-010569450
[4] Singer Merits Report Production; Singer Merits Supplemental Report Production

Exhibit E
Public Redacted Version

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

IN RE GOOGLE PLAY STORE ANTITRUST LITIGATION

THIS DOCUMENT RELATES TO:

In re Google Play Consumer Antitrust Litigation, Case No. 3:20-cv-05761-JD

No. 3:21-md-02981-JD

SUPPLEMENTAL MERITS REPLY REPORT

OF

HAL J. SINGER, PH.D.

Judge: Hon. James Donato

PARTY AND NON-PARTY HIGHLY CONFIDENTIAL – ATTORNEYS' EYES ONLY

INTRODUCTION

1. I have been asked by counsel for Consumer Plaintiffs to respond to the new opinions in Dr. Leonard's supplemental expert report (dated June 14, 2023).[1] Dr. Leonard's report follows my supplemental expert report (dated May 12, 2023), in which I presented individual damages calculations for Mary Carr, Daniel Egerter, Zack Palmer, Serina Moglia, Matthew Atkinson, and Alex Iwamoto.[2]

2. In the Singer Supplemental Report, I calculated overcharges by comparing the actual take rate for a given Play Store *category* to the but-for take rate for that same *category*.[3] This generated a category-level overcharge, which was applied to each individual plaintiff's total expenditures in that category.[4] I also explained that developer-specific overcharges could be calculated using the same framework. Under the developer-specific approach, the actual take rate for a given developer's SKUs would be compared to the but-for take rate for that same developer's SKUs.[5]

3. In his Supplemental Report, Dr. Leonard mistakenly compares actual take rates for *specific SKUs at specific points in time* to but-for take rates for *entire Play Store categories* across the entire Class Period. In doing so, Dr. Leonard compares apples to oranges. It is this flawed comparison that generates the "anomalous results" that Dr. Leonard reports.[6] Dr. Leonard makes these flawed apples-to-oranges comparisons in two dimensions. *First*, based on a flawed comparison between the actual take rates on *specific SKUs* to the average *category-wide* but-for take rate, Dr. Leonard calculates that, for certain transactions involving certain SKUs with relatively low take rates, the service fees exceed the average category-wide overcharge. *Second*, based on a flawed comparison between the actual take rates on SKUs *at specific points in time* to average category-wide but-for take rates *across the Class Period*, Dr. Leonard calculates that, for certain transactions involving certain SKUs with relatively low take rates at certain points in time, the service fees exceed the average overcharge over the Class Period.

4. Below I explain how Dr. Leonard's errors can be corrected by calculating but-for take rates and overcharges for the SKUs of each developer at each point in time, following the

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1. Supplemental Expert Report of Dr. Gregory K. Leonard (June 14, 2023) [hereafter, "Leonard Supplemental Report"].

2. Supplemental Merits Report of Hal J. Singer, Ph.D. (May 12, 2023) [hereafter, "Singer Supplemental Report"]. The materials I relied upon in forming my opinions are included in the footnotes throughout this report, included in my backup materials, or otherwise listed in my prior reports. Unless otherwise defined, capitalized terms herein are defined the same as they are in my prior reports. *See* Merits Report of Hal J. Singer, Ph.D. (October 3, 2022) (as updated on October 19, 2022) [hereafter, "Singer Merits Report"]; *see also* Merits Reply Report of Hal J. Singer, Ph.D. (December, 23, 2022) (as updated on January 6, 2023) [hereafter, "Singer Merits Reply"]; Class Certification Report of Hal J. Singer, PhD (February 28, 2022) [hereafter, "Singer Class Cert Report"]; Class Certification Reply Report of Hal J. Singer, PhD (April 25, 2022) [hereafter, "Singer Class Cert Reply"]; Class Certification Reply Report of Hal J. Singer, PhD (Errata) (May 10, 2022) [hereafter, "Singer Class Cert Reply Errata"].

3. *See, e.g.*, Singer Supplemental Report ¶4; Table 1.

4. *Id.*

5. *Id.* ¶4, n. 4.

6. Leonard Supplemental Report ¶4(d).

procedures described in my Supplemental Report and Merits Report.[7] When I correct Dr. Leonard's errors by performing the proper, apples-to-apples comparison—by comparing developers' actual take rates on particular SKUs at each point in time to developers' but-for take rates on particular SKUs at each point in time—Dr. Leonard's purportedly anomalous results disappear.

5. In making these calculations, the take rates for the SKUs of each developer fall in proportion to the overall decrease in take rates that would have occurred in the but-for world. This adjustment accounts for the fact that developers' relative bargaining leverage and incentives—as measured by their ability to achieve a take rate below the 30 percent headline rate—would remain the same in the but-for world. When my damages model is implemented in this manner, it is not possible for the but-for take rate to exceed the actual take rate or for overcharges to exceed service fees, even at the granular of Dr. Leonard's analysis. To illustrate, below I have performed damages calculations for each of the individual plaintiffs that are specific to each developers' SKUs at each point in time. These calculations confirm that, for all developers and all transactions, the but-for take rate is *always* less than the actual take rate, and overcharges are *always* less than service fees.

6. Finally, as explained below, Dr. Leonard's Supplemental Report repeats many of the same critiques I have already rebutted, which still fail to undermine my conclusions.

I. DR. LEONARD'S NEW CALCULATIONS DO NOT UNDERMINE MY CONCLUSIONS

7. Dr. Leonard claims incorrectly that, in my App/In-App damages calculations, my method "frequently estimates that developers were overcharged on service fees by an amount that is more than the total amount of the service fee they paid on the transaction."[8] Dr. Leonard also claims incorrectly that, in my Single Take Rate and Hybrid damages calculations, "the but-for service fee rate that Dr. Singer predicts would have applied to many of the plaintiffs' transactions is higher than the service fee rate that actually applied to those transactions."[9] Both of these claims are based on Dr. Leonard's own flawed apples-to-oranges calculations. As explained below, these new critiques are invalid when the calculations are performed on an apples-to-apples basis.

8. In my Merits Report, as illustrated in Tables 23-24, I estimate individual damages by comparing the actual take rate for a given *category* to the but-for take rate for that *category*. Specifically, I first calculate the actual take rate for a given category using Play Store data. For example, in Table 24 of my Merits Report, the actual take rate for in-app transactions in the "Arts and Design" category is 26.4 percent.[10] Next, I calculate the but-for take rate by allowing the category's take rate to fall by the same proportion as the decline in the aggregate take rate. The ratio of the but-for aggregate take rate to the actual aggregate take rate for in-app transactions, as

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7. Singer Supplemental Report ¶4, n. 4; *see also* Singer Merits Report ¶422, n. 957. I reserve the right to perform comparable calculations for all Class Members in the future.

8. Leonard Supplemental Report ¶4(e).

9. Leonard Supplemental Report ¶4(f). By Dr. Leonard's logic, there should be negative damages on such transactions. But even Dr. Leonard's flawed apples-to-oranges calculations yield positive damages for these transactions.

10. Singer Merits Report Table 24 (first row).

calculated in Table 8 of my Merits Report, is approximately 47 percent.[11] This yields a but-for take rate of 12.4 percent [0.47 x 26.4 percent] for the "Arts and Design" category. Next, I use the pass-through rate (67 percent for the Arts & Design category) to calculate the category-level overcharge percentage (equal to 10.2 percent for the Arts & Design category).[12] This category-level overcharge percentage is applied to each individual Class Member's expenditures in this category.

9. In my merits report, I also specified that I performed this analysis at the category level "for ease of exposition and presentation," but that "the same framework could also be applied at the level of the developer."[13] Dr. Leonard does not apply the correct developer-level framework. Instead, Dr. Leonard compares category-level but-for take rates and overcharges to the actual take rates and service fees developers paid on particular SKUs at specific points in time. But to make a meaningful comparison consistent with my methodology set out in the merits report, Dr. Leonard should have calculated but-for take rates and overcharges at the same level of specificity as the actual take rates he uses. In other words, because Dr. Leonard attempts to analyze the actual take rate for each of those developers' particular SKUs at the specific points in time, he should have calculated the but-for take rates in the same manner. For example, suppose the take rate for a SKU from Developer *A* is 30 percent in the actual world. If the take rate falls by half in the but-for world, then this developer would enjoy an extra 15 percent of revenue for this SKU. Assuming (without loss of generality) that the pass-through rate is 100 percent, then the consumer overcharge would be equal to 15 percent of consumer expenditure for that SKU from Developer *A*.

10. Next, suppose the take rate for a SKU from Developer *B* is only 20 percent in the actual world. If the take rate for this SKU from Developer *B* would also fall by half in the but-for world, then this Developer would enjoy an extra ten percent of revenue. Assuming (again without loss of generality) that the pass-through rate is 100 percent, the consumer overcharge is equal to ten percent of consumer expenditure for that SKU from Developer *B*. The overcharge percentage is smaller for the SKU from Developer *B* than the SKU from Developer *A* (ten percent compared to fifteen percent) because the SKU from Developer *B* enjoyed a lower take rate in the actual world. The same logic applies when comparing different time periods. For example, if a SKU from Developer *B* has a higher take rate before mid-2021 than after, then overcharges for that SKU from Developer *B* are higher before mid-2021 than after.

11. More generally, in the but-for world, the take rate declines proportionally for every developer's SKU in every time period. Again, this is due to the fact that developers' relative bargaining power and incentives remain fixed in the but-for world.

12. When the damages model is implemented correctly, on an apples-to-apples basis, it is not possible for the but-for take rate to exceed the actual take rate, or for overcharges to exceed service fees, even at the granular level of Dr. Leonard's analysis. To illustrate, I have performed damages calculations for each of the individual plaintiffs that are specific to each developer's

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11. Singer Merits Report Table 8 (in the aggregate, the ratio of the but-for take rate to the actual take rate is 14.4%/30.5% = 0.47).

12. The overcharge percentage could be approximated as [0.264 – 0.124] x 0.67 = 9.4 percent. The 10.2 percent overcharge is calculated using a more precise formula. Singer Merits Report ¶¶427-428 (solving for the but-for price as a function of the actual and but-for take rates and the pass-through rate).

13. Singer Merits Report ¶422, n. 957.

SKUs at each point in time. The calculations confirm that there are no transactions in which the developer's but-for take rate exceeds its actual take rate or in which the developer's overcharges exceed its service fees.[14]

13. The tables below display individual damages for this method, alongside the category-level method used in my Supplemental Report.

TABLE 1: INDIVIDUAL DAMAGES - APP/IN-APP MODEL

Plaintiff	**Expenditures**	**Category-Level Damages**	**Developer/Transaction Level Damages**	**Percent Change from Category-Level Damages**
[redacted]				-10.0% 22.2% -3.5% -7.4% -3.4% 15.8%
AVERAGE				**2.3%**

TABLE 2: INDIVIDUAL DAMAGES – SINGLE TAKE RATE MODEL

Plaintiff	**Expenditures**	**Category-Level Damages**	**Developer/Transaction Level Damages**	**Percent Change from Category-Level Damages**
[redacted]				-9.7% 6.6% -5.0% -4.2% -3.3% 8.7%
AVERAGE				**-1.2%**

14. *See* work papers (spreadsheet listing take rates, overcharges, and service fees for each transaction for each individual plaintiff).

TABLE 3: INDIVIDUAL DAMAGES – HYBRID MODEL

Plaintiff	Expenditures	Category-Level Damages	Developer/Transaction Level Damages	Percent Change from Category-Level Damages
[redacted]				-1.2%
				0.7%
				-4.9%
				-1.2%
				-4.9%
				-3.2%
AVERAGE				**-2.4%**

As Tables 1 through 3 show, the average percentage change in damages across the six individual plaintiffs as one toggles between category-level damages and developer/transaction-level damages is *de minimis*, ranging from an average decrease of 2.4 percent to an average increase of 2.3 percent.

14. Dr. Leonard's analysis includes other errors as well. Dr. Leonard singles out two payments by [redacted] for a specific SKU for the [redacted] in July and August of 2021.[15] During these two months, the take rate for this SKU fell—*temporarily*—to 15 percent. Because [redacted] was priced at [redacted] per month, Dr. Leonard calculates that the service fees for this SKU came to [redacted] in each of July and August of 2021.[16] Because Dr. Leonard calculates transaction-specific overcharges of [redacted] for this SKU in July and August of 2021, and because [redacted] is less than [redacted], he concludes that [redacted] was overcharged by more than the amount of the service fees for this SKU during these two months.

15. This calculation ignores that the take rate for this SKU was 30 percent in June of 2021 (when [redacted] first subscribed to the SKU) and returned to 30 percent in September, October, and November of 2021 (when [redacted] remained subscribed to the SKU).[17] During each of these four months, Dr. Leonard calculates service fees of [redacted]. Accordingly, the service fees that Dr. Leonard calculates for the duration of [redacted] six-month subscription to this SKU (June through November of 2021) come to [[redacted] x 4 months] + [[redacted] x 2 months] = [redacted].[18] These service fees *exceed* the transaction-specific overcharges Dr. Leonard calculates for the same time period for this SKU, which come to [redacted].[19] Therefore, Dr. Leonard's own calculations show that [redacted] overcharges did not exceed the service fees for [redacted] purchases of this SKU. Dr. Leonard's error is rooted in (1) performing an improper apples-to-oranges

15. Leonard Supplemental Report ¶16.
16. Leonard Supplemental Report Appendix C3, Rows 25-26.
17. Leonard Supplemental Report Appendix C3, Rows 24-29.
18. *Id.*
19. *Id.*

comparison; and (2) his decision to consider only two out of the six months of Carr's purchases of this SKU.[20]

II. DR. LEONARD'S RECYCLED CRITIQUES ARE STILL WRONG

16. Dr. Leonard repeats many of the same critiques I have already rebutted, which also fail to undermine my conclusions. Dr. Leonard repeats his misguided analysis of the highly limited and short-lived take rate reductions in the actual world, which remains unreliable for a variety of reasons, including developers' inability to steer.[21] Dr. Leonard also claims incorrectly that I "appear[] to predict" that, in the but-for world, focal-point pricing would have been "almost entirely abandoned."[22] As I have explained previously, at most a *de minimis* share of apps would refrain from decreasing their prices due to focal-point pricing in the but-for world, as finding the closest price that ends in nine to the new profit-maximizing price would be trivial.[23]

CONCLUSION

17. For the foregoing reasons, Dr. Leonard's Supplemental Report does not undermine my opinions.

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20. Had Dr. Leonard performed the correct apples-to-apples comparison, he would have found that the service fees exceed the transaction-specific overcharges in every month, including July and August of 2021.

21. Leonard Supplemental Report ¶4(b). As I have explained, Google's highly limited take rate reductions in the actual world do not provide a valid basis for estimating the pass-through resulting from systemic and long-lived take rate reductions in the but-for world. Singer Merits Reply ¶5; ¶¶19-39. Dr. Leonard also claims incorrectly that pass-through would be absent in the but-for world due to "instances where developers sell SKUs on their own websites in addition to Play, [and] the developers charge the same price on both channels even though they do not pay any app store service fees for transactions on their own websites." Leonard Supplemental Report ¶4(b). As I have explained, the Challenged Conduct limited developers' ability and incentives to steer via differential pricing on websites versus the Play Store, which is a key mechanism by which pass-through would have occurred in the but-for world. Singer Merits Report ¶369; Singer Merits Reply ¶19.

22. Leonard Supplemental Report ¶4(c).

23. Singer Merits Report ¶¶408-413; Singer Merits Reply ¶8, n. 21.

***

Hal J. Singer, Ph.D.:

Executed on June 30, 2023.

Exhibit F
Public Redacted Version

No.	Purchase Date	Product ID	Type	App Category	Post-Tax Net Price	Pre-Tax Net Price	Actual Take Rate (%)	Pass-Through Rate	But-For Take Rate (%)	But-For Expenditure	CM Damages	CM Overcharge (%)	Overcharge <= Service Fee?
1	[redacted]												
2													
3													
4													
5													
6													
7													
8													
9													

No.	Purchase Date	Product ID	Type	App Category	Post-Tax Net Price	Pre-Tax Net Price	Actual Take Rate (%)	Pass-Through Rate	But-For Take Rate (%)	But-For Expenditure	CM Damages	CM Overcharge (%)	Overcharge <= Service Fee?
10	[redacted]												
11													
12													
13													
14													
15													
16													
17													
18													

No.	Purchase Date	Product ID	Type	App Category	Post-Tax Net Price	Pre-Tax Net Price	Actual Take Rate (%)	Pass-Through Rate	But-For Take Rate (%)	But-For Expenditure	CM Damages	CM Overcharge (%)	Overcharge <= Service Fee?
19	[redacted]												
20	[redacted]												
21	[redacted]												
22	[redacted]												
23	[redacted]												
24	[redacted]												
25	[redacted]												
26	[redacted]												
27	[redacted]												

No.	Purchase Date	Product ID	Type	App Category	Post-Tax Net Price	Pre-Tax Net Price	Actual Take Rate (%)	Pass-Through Rate	But-For Take Rate (%)	But-For Expenditure	CM Damages	CM Overcharge (%)	Overcharge <= Service Fee?
28	[redacted]												
29													
30													
31													

All Overcharge Less Than Actual Service Fee?	**YES**
Total Damages Reported in Singer Supplemental	**$21.66**
Total Damages Using Transaction Level Take Rate (only includes transactions used in Singer Supplemental Report)	**$19.49**
Difference from Initial Supplemental Report	**$2.17**

No.	Purchase Date	Product ID	Type	App Category	Post-Tax Net Price	Pre-Tax Net Price	Actual Take Rate (%)	Pass-Through Rate	But-For Take Rate (%)	But-For Expenditure	CM Damages	CM Overcharge (%)	Overcharge <= Service Fee?
1	[redacted]												
2	[redacted]												
3	[redacted]												
4	[redacted]												
5	[redacted]												
6	[redacted]												
7	[redacted]												
8	[redacted]												
9	[redacted]												

No.	Purchase Date	Product ID	Type	App Category	Post-Tax Net Price	Pre-Tax Net Price	Actual Take Rate (%)	Pass-Through Rate	But-For Take Rate (%)	But-For Expenditure	CM Damages	CM Overcharge (%)	Overcharge <= Service Fee?
10	[redacted]												
11													
12													
13													
14													
15													
16													
17													
18													

No.	Purchase Date	Product ID	Type	App Category	Post-Tax Net Price	Pre-Tax Net Price	Actual Take Rate (%)	Pass-Through Rate	But-For Take Rate (%)	But-For Expenditure	CM Damages	CM Overcharge (%)	Overcharge <= Service Fee?
19	[redacted]												
20													
21													
22													
23													

All Overcharge Less Than Actual Service Fee?	**YES**
Total Damages Reported in Singer Supplemental	**$3.72**
Total Damages Using Transaction Level Take Rate (only includes transactions used in Singer Supplemental Report)	**$4.31**
Difference from Initial Supplemental Report	**-$0.59**

Exhibit G

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

____

IN RE GOOGLE PLAY STORE ANTITRUST LITIGATION	) Case No. 3:21-md-02981-JD
THIS DOCUMENT RELATES TO:	)
Epic Games Inc. v. Google LLC, et al.,	)
Case No. 3:20-cv-05671-JD	)

____

** HIGHLY CONFIDENTIAL **
ZOOM VIDEOTAPED DEPOSITION OF HAL SINGER
Vienna, Virginia
Tuesday, July 18, 2023

Reported by:
LORI M. BARKLEY, CSR No. 6426

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

____
)
IN RE GOOGLE PLAY STORE) Case No.
ANTITRUST LITIGATION) 3:21-md-02981-JD
)
)
THIS DOCUMENT RELATES TO:)
)
)
Epic Games Inc. v.)
Google LLC, et al.,)
)
)
Case No. 3:20-cv-05671-JD)
____

Zoom videotaped deposition of HAL SINGER, at Vienna, Virginia, beginning at 9:32 a.m. Eastern time, and ending at 12:06 p.m., on Tuesday, July 18, 2023, before LORI M. BARKLEY, Certified Shorthand Reporter No. 6426.

APPEARANCES:

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Videographer: John O'Connell

INDEX

EXHIBITS

Vienna, Virginia; Tuesday, July 18, 2023
9:32 a.m. Eastern Standard Time

VIDEO OPERATOR: We're on the record. It's 9:32 a.m., Eastern time, on July 18th, 2023. This is the deposition of Dr. Hal Singer. We're here in the matter of Google Play Store Antitrust Litigation. I'm John McDonnell, the videographer with Veritext.

Before the reporter swears in the witness, would counsel please identify themselves, beginning with the noticing attorney, please.

MR. RAPHAEL: Sure. Justin Raphael, Munger Tolles & Olson, for Google.

MS. GIULIANELLI: Karma Giulianelli, Bartlit Beck, for consumers.

MR. BLOOM: Bryan Bloom from New York Attorney General's office.

THE REPORTER: Dr. Singer, if you could please raise your right hand so I can swear you in.

(Witness sworn.)

HAL SINGER,

having been administered an oath, was examined and testified as follows:

equal in general, they'll charge lower prices?

A. I think that's what the general teachings of economics would suggest, yes, that prices are going to move in accordance to a firm's marginal costs in competitive industries. Prices will be tightly tethered to those costs.

Q. And you have criticized Dr. Leonard for predicting that if developers were subject to lower service fees, then they would charge higher prices?

A. It's possible. Certainly not in my supplemental -- or in my supplemental reply, but it's conceivable that in a merits reply, I made that criticism. It's not -- it's just not coming back to me.

Q. In your opinion, is it wrong to predict that developers would charge higher prices on transactions with lower service fees?

A. That tends to go against the teachings of economics. I imagine you could construct a demand system in which the pass-through rates might work out that way. I mean, there is a -- economists are good at coming up with models and counter-intuitive outcomes, but that one seems pretty farfetched.

Q. Right. And in the Logit model of demand that, you know, you say fits the data here, it wouldn't be consistent with the teachings of economics that if

developers' service fees went down, that they would raise their prices?

A. Right. That would not be consistent.

Q. Does any damage model that you used predict that a developer would charge a higher price if its service fees went down?

A. Just so I have it clear, you said any damages model that I used here. I think the only models that really speak to the pass-through are the pass-through models, right?

And I'm of the opinion -- I've tried several, and I think the Logit best fits the data. And so no, you'd never get that outcome, if I'm hearing you right, where a cost -- marginal cost goes down and the price goes up. That would not be consistent with the Logit model.

MR. RAPHAEL: I'm going to mark an exhibit here, which I believe is going to be Defendant's Exhibit 1146. Just give me a moment.

THE WITNESS: Okay.

(Exhibit 1146 was marked for identification by the court reporter and is attached hereto.)

MR. RAPHAEL: All right. I think that's been introduced.

Q. Let me know if you can see Defendant's

level predicts that in the January 5th, 2022, Microsoft SkyDrive transaction, the price would have been $2.01; is that right?

A. That's what's coded here.

Q. Okay. And so according to your exact but-for data for your supplemental report, at the transaction/developer level, your model predicts that if the service fee for Microsoft SkyDrive was 14.2 percent, the price would have been $1.83, but if the service fee was only 7.1 percent, the price would actually be higher at $2.01; is that right?

A. Well, I think that this could be a typo in the cell because I don't think that the formula would predict a higher price.

Q. Okay. Well, do you see --

A. Because I can't see the formula, again, I can't diagnose the problem for you. But we can do the math, but the price would not be higher than the actual price. That's not possible under the math.

Q. Okay. Well, if you look at rows 20, 21, and 22, and 23, those are also subscriptions to Microsoft SkyDrive in the early months of 2022; is that right?

A. Okay. Now I'm scrolling down. Yes.

Q. Okay.

A. And you see we've got damages of 15 cents in the

everything is the same.

In the first transaction, we're beginning with a service fee rate of 30 percent, so, say, with a $21.39 price. And the second transaction, you're beginning with a 15 percent. So I think that what's happening is that you have a bigger absolute decline in the service fee in the first transaction. The step down from 30 to 14 percent in nominal levels is a bigger step down from the step down from 15 to 7 percent.

And so as a result, this model is going to credit and flush through a bigger reduction in service fee -- absolute terms, right -- for the consumer with that 94 percent pass-through rate. So I don't think there's anything anomalous between the 17 and the 19 outcomes in light of the differential and starting place.

Q. Well, I'm just asking as a factual matter. It's true, is it not, that your supplemental reply report predicts that if the service fee for the same transaction went down, that the price would actually be higher?

A. No, because you're violating the ceteris paribus assumption. My model will always predict, when all things are equal, a lower service fee will generate a lower price for sure. There's no way to get around

we have here, right?

A. I don't know that. But if you want me to go to a different cell, I --

Q. No, I'm just asking the rows below transaction 19, there is a bunch more transactions with Microsoft SkyDrive, and Microsoft kept the price the same even though the service fee rate remained lower than it was, right?

MS. GIULIANELLI: Objection to the form of that question with respect to service fee rate.

BY MR. RAPHAEL:

Q. Okay. Is the answer to that question yes?

A. It appears that Microsoft kept its price through at least May of 2022. That's true.

Q. Okay. Now, if we go back to row 19, what you did earlier is that if instead of keeping the price the same at $2.16 for SkyDrive, when its service fee went down from 30 to 15 percent, if Microsoft had actually lowered the price to $1.95, you would get a but-for price that was lower than the price you predict if the service fee rate was higher, right?

A. Well, I'll give you that it would be lower than the price that I predicted in the prior example, with all the details in the prior example. But yes, if I put in $1.95, I get to a $1.91 -- $1.91 but-for price.

Q. So if Microsoft keeps the price the same when the service fee goes from 30 to 15 percent, your model predicts that at a lower service fee, it actually charges a higher price. But if it changed the price and lowered it when its service fee went down, your model predicts that the service fee would go down -- let me try that again. Let's take it in two parts.

A. Okay.

Q. When Microsoft charges the same price at a 30 percent service fee and a 15 percent service fee, your model predicts that in the but-for world, Microsoft would charge a higher price at a lower service fee rate?

MS. GIULIANELLI: Objection to the form.

THE WITNESS: I think in my but-for world, in both examples, the but-for price comes in below the actual price, so there's savings in both to the consumer.

But it is true that in the first example, the price is lower because my model begins with the savings to the developer, and if the developer's savings are bigger, all things equal, including beginning from the same price, you're going to get to a lower but-for price. There's just more money to share with the consumer.

BY MR. RAPHAEL:

Q. Right. And if, instead, Microsoft had changed its price when its service fee went down and lowered it to $1.95 instead of $2.16, the result changes in your but-for world. When the service fee goes down, the price goes down, right?

A. The result changes.

The logic of my prior answer, the math of -- embedded in my prior answer, doesn't change. All that's still happening. We still have a smaller step down, the second example. But now, because we're assuming counter-factually that you're beginning from a lower price, you do get to a lower but-for price.

Q. So the reason why your model predicts a higher price when the -- at a lower service fee rate in the but-for world is that that $2.16 price for Microsoft was the same even though the actual service fee went down?

A. I mean, if I could just put it in my words, it's because the $2.16 price was calibrated around a higher initial take rate. And my formula, as you know, is a function of the initial take rate and, importantly, the step down from the initial take rate.

THE REPORTER: I'm sorry. Importantly, the what?

THE WITNESS: Oh, the step down from the initial take rate.

Exhibit H

From:	Karma Giulianelli <karma.giulianelli@bartlitbeck.com>
Sent:	Wednesday, July 26, 2023 10:08 AM
To:	Raphael, Justin; #GoogleEpic; Match.com/Google [INT]; State AG Mailing List for Google (StatesGooglePlayLeads@agutah.gov); Epic Mobile Apps; Mailing List - Google Consumers External
Cc:	~PLAY_MTO; Play Litigation
Subject:	RE: Singer Daubert Motion
Follow Up Flag:	Follow up
Flag Status:	Completed

[EXTERNAL EMAIL]
Justin,

We do not consent to filing a supplemental brief.

BartlitBeck LLP
Karma M. Giulianelli | p: 303.592-3165 | c: 303.641-6599 | Karma.Giulianelli@BartlitBeck.com | 1801 Wewatta St. Suite 1200, Denver, Colorado 80202

From: Raphael, Justin <Justin.Raphael@mto.com>
Sent: Tuesday, July 25, 2023 10:30 PM
To: #GoogleEpic <GoogleEpic@omm.com>; Match.com/Google [INT] <matchgoogle@hueston.com>; State AG Mailing List for Google (StatesGooglePlayLeads@agutah.gov) <StatesGooglePlayLeads@agutah.gov>; Epic Mobile Apps <epic-mobileapps@cravath.com>; Mailing List - Google Consumers External <GoogleConsumersExternal@bartlitbeck.com>
Cc: ~PLAY_MTO <~PLAY_MTO@mto.com>; Play Litigation <PlayLitigation@morganlewis.com>
Subject: Singer Daubert Motion

Caution: External Message

Counsel,

Pursuant to Local Rule 7-11, Google intends to file with the Court an administrative motion for leave to file a short supplemental brief in further support of its *Daubert* motion to exclude the testimony of Dr. Singer addressing Dr. Singer's supplemental reports. Please let us know by 2 PM Pacific on Wednesday whether Plaintiffs consent to Google's filing of a supplemental brief.

Best,

Justin

Justin P. Raphael | Munger, Tolles & Olson LLP
560 Mission Street | San Francisco, CA 94105
Tel: (415) 512-4085 | justin.raphael@mto.com | www.mto.com